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State of Colorado
BIENNIAL REPORT

of the

Colorado State Board of Health

For the Years

1938-1939

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STATE OF COLORADO

BIENNIAL REPORT

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R. L. CLEERE, M.D., M.P.H.
Secretary and Executive Officer
STATE OFFICE BUILDING
DENVER, COLORADO

THE HONORABLE RALPH L. CARR
Governor of Colorado

whose active and continuous support of the public health program, administered by the State Board of Health, has done so much to protect the people of Colorado from communicable and preventable diseases.

BIENNIAL REPORT OF THE COLORADO STATE BOARD OF HEALTH

For the Years 1938-1939

THE HONORABLE RALPH L. CARR,
Governor of the State of Colorado,
Denver, Colorado.

My dear Governor Carr:

I have the honor to transmit herewith the Biennial Report of the Colorado State Board of Health for the years 1938-1939.

Respectfully yours,
R. L. CLEERE, M.D., M.P.H.
Secretary and Executive Officer.

State Office Building,
Denver, Colorado,
October 1, 1940.

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AS OF DECEMBER 31, 1939

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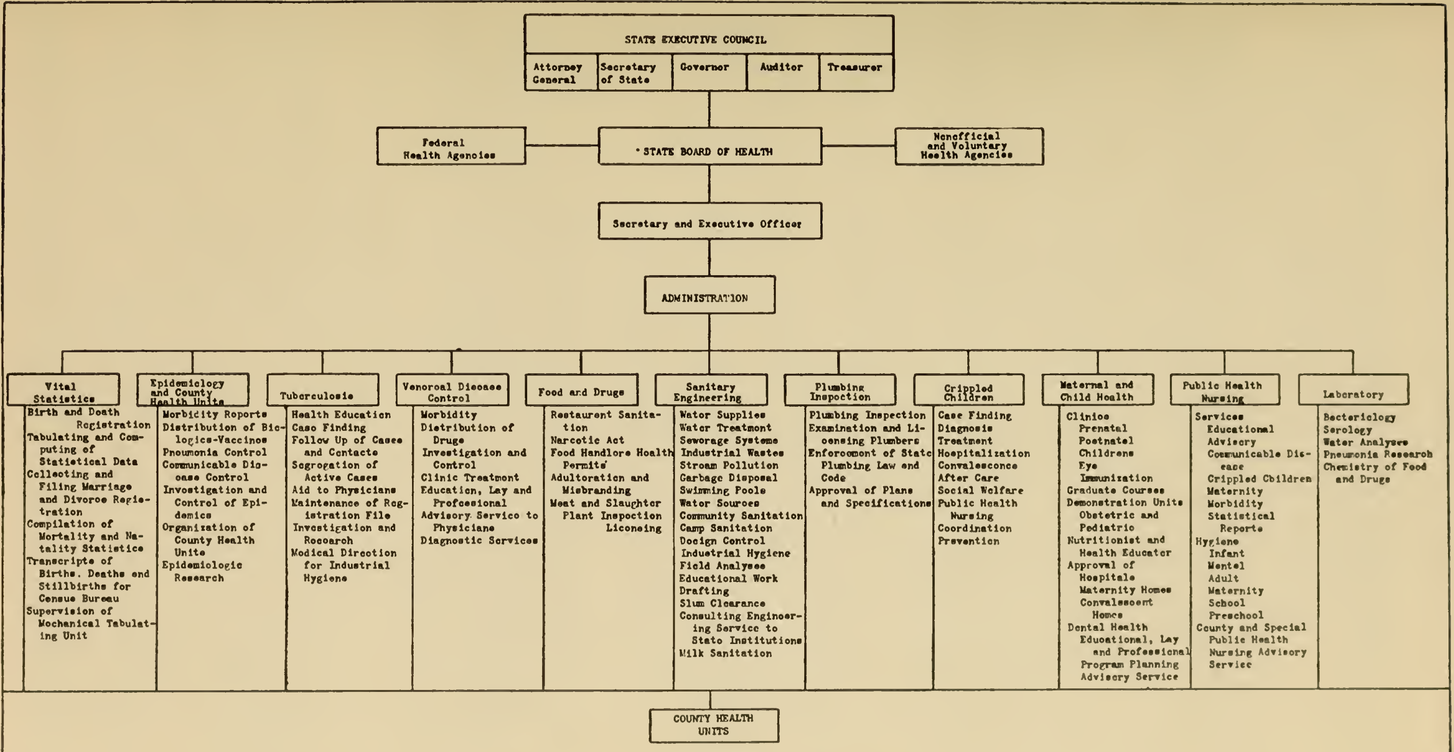

ORGANIZATION CHART

COLORADO STATE DIVISION OF PUBLIC HEALTH

DIVISION OF ADMINISTRATION

R. L. Cleere, M.D., M.P.H.

Secretary and Executive Officer

An examination of the development of the Public Health Program in Colorado shows an uninterrupted succession of gains in health services throughout 1938 and 1939. These gains have provided increased health protection for all the people of the State and are reflected in a diminishing death rate and an increased birth rate. Likewise, during these two years the State has been remarkably free from serious communicable disease and has had no epidemics of consequence. Although the general well being of the people and the resulting decline in the death rate is due to a multiplicity of factors, it is felt that the improvement in sanitation and increased health services supplied by the Division of Public Health have been important contributing elements. This factor has been of paramount importance, we believe, in contributing to the decline in the infant mortality rate and the drop in the incidence of enteric infections.

In order to furnish adequate protection to the people of the State against communicable and preventable endemic, epidemic, occupational, and other diseases, and to promote hygienic living and better health standards throughout the State, the Division of Public Health has been organized into divisions as follows:

DIVISION OF ADMINISTRATION

This division is the central coordinating authority which administers and supervises the activities of all divisions of the department. The administrative organization is illustrated graphically in the accompanying organization chart which shows the functions and activities of all divisions. The Division of Administration is under the direction of the Secretary and Executive Officer of the State Board of Health.

DIVISION OF CRIPPLED CHILDREN

The aim of this division is to provide an equal opportunity for adequate diagnosis and treatment for all children in the State who are afflicted with crippling conditions. The chief activity of the Division is the provision of diagnostic, curative, and after-care facilities for children with orthopedic disabilities; although the program also provides for the care of harelip, cleft palate, plastic surgery, certain surgical eye conditions and will probably be extended to include crippling heart conditions. The main activities of the division are:

1. The maintenance of a register of crippled children. It is hoped that this register will soon contain the names of all crippled

children in Colorado, regardless of the financial status of the child. During the biennium, the number of children registered has more than doubled. (The number was 1028 at the end of 1937, and at the end of 1939 was 2155).

2. Diagnostic Services. The State has been divided into eighteen clinic areas in order to, whenever possible, provide diagnostic examinations in the district in which the child lives. This service has also increased a great deal as shown by the fact that in 1938, 720 examinations were made while in 1939, this number reached 2062.

3. Curative Treatment. The object of this service is to provide adequate care and treatment for every crippled child in the State, who, without such aid, would be unable to receive it. The aim of treatment is, of course, to restore the child to his maximum physical capacity in order that he may become a self-sustaining individual and not dependent upon his family or his community for support.

FOOD AND DRUGS

The major objectives of this division are:

1. That all foods and drugs are manufactured, prepared, or sold under sanitary and healthful conditions.
2. To protect the consumer from purchasing adulterated or misbranded products.
3. To see that all persons employed in the handling of food are free from communicable disease.
4. To aid the federal narcotic bureau in the control of narcotics, including marihuana.

DIVISION OF LABORATORIES

The demand for bacteriological and serological examinations increased many fold in 1938 and 1939. The magnitude of this increase is shown by the increase in the number of serological examinations made for syphilis. In 1935, for example, 13,766 of these tests were made, while in 1939, this number had increased to 99,719. During the biennium, two new services were made available to the physicians of the State. These were (1) a pneumococcus typing service, and (2) the examination of sputum for tubercle bacilli by culture as well as the regular direct smear and concentration methods. Although the volume of work done by the Laboratory has increased tremendously in the last two years, it is the pride of the Department that the accuracy of the tests has remained at its previously high level.

DIVISION OF MATERNAL AND CHILD HEALTH

The purpose of this division is the preservation of the lives of mothers, infants, and children throughout the State. Services toward this end are provided by six prenatal and postnatal clinics and eleven well-baby clinics situated in various cities of the State. In three areas where special need exists, maternity demonstration nursing units have been established. These units provide prenatal care for the expectant mother and give assistance to the physician when deliveries are conducted in the home. They also provide post-partum nursing care following such deliveries. Provisions have been completed to add a sub-division of Dental Health to the Division on January 1, 1940.

DIVISION OF PLUMBING

The duties of this division are to examine, as provided by law, the fitness and qualifications of all persons applying for a license to engage in the business, trade, or calling of a Master or Journeyman Plumber. Likewise, it is the duty of this division to make sure that all plumbing installations in the State comply with the provisions of the sanitary code.

DIVISION OF PUBLIC HEALTH NURSING

In addition to the nursing services provided by our full-time county health units and those in the maternity demonstration units, 58 nurses have been assigned to 33 counties in the State. These county nursing services are financed jointly by the State and counties, and these nurses, in cooperation with local agencies, provide generalized public health nursing. The popularity of this program can be inferred from the fact that there has been an ever-increasing demand for this type of service.

RURAL HEALTH AND EPIDEMIOLOGY

1. Full-time County Health Units. The most important defense against invasion by disease and sickness is the full-time county or district health unit. The health officer or director of such a unit commands the health forces against the attacks of all forms of disabling diseases; the sanitarian furnishes the artillery, and the clerk-stenographer can be compared to the radio operator, while the nursing personnel is comparable to the infantry. It is the nurses who do the ''mopping up'' and hold the ground gained in this war against preventable disease and sickness.

Colorado now has three functioning full-time health units. The first was established in Otero County in 1937, the second in Weld County in June 1938, and the third in El Paso County in July 1939. This is a beginning, but provides only 20% of our population with health protection from disease. The desirability of such units is becoming increasingly appreciated in Colorado and it is hoped that eventually all our people will be provided with such services. One county, Denver, has arranged to start such a unit on January 1, 1940, and several other counties are inquiring about the feasibility of acquiring a full-time health unit.

2. Epidemiology. Through this unit the services of a specially trained epidemiologist have been made available to the communities and counties of the State, to assist the people and physicians in investigating and controlling epidemics and in preventing their occurrence or reoccurrence. Special immunization clinics are being conducted each year and vaccines and immunizing biologics are furnished for these clinics without cost to the community. Since the establishment of the Division of Epidemiology, no communicable disease has reached serious epidemic proportions in the State.

In 1938, the control of Venereal Disease assumed increased significance in the United States. In conformity with this movement, the Division of Epidemiology, in conjunction with the Syphilis Committee of the Colorado State Medical Society, organized several clinics for the control of these diseases. The first of these clinics was established in Pueblo on January 10, 1938. Later in the year, Venereal Disease clinics were also established at the El Paso County Courthouse in Colorado Springs and at the Colorado General Hospital in Denver. In 1939, this work was extended by establishing clinics in conjunction with the Otero and Weld County Public Health Units. Likewise, in this year, two Venereal Disease Control Plans were put in operation, one of these in Prowers and one in Baca County. In these two rural areas, the plan provides for treatment by private physicians on a fee basis agreed upon by the local County Medical Society and County Commissioners. As a further measure in the control of communicable disease, the Department of Public Health has made arrangements for the establishment of a separate division of Venereal Disease Control on January 1, 1940.

As a further measure in the control of communicable disease, the Department of Public Health has made arrangements for the establishment of a separate division of Venereal Disease Control on January 1, 1940.

SANITARY ENGINEERING

The duties of this division include sanitary supervision of public water supplies and sewage disposal systems, bathing beaches, swimming pools, tourist and summer camps and other recreational establishments. Under its supervision, 21 municipal sewage treatment plants were constructed in the biennium. With these new plants, 83.6% of the urban population are now provided with adequate sewage treatment facilities.

In the spring of 1938, the Division of Sanitary Engineering, cooperating with the United States Public Health Service, made a state-wide Industrial Hygiene Survey. Following this survey, an Industrial Hygiene Unit was established as a part of this Division. This unit consists of an Industrial Hygienist and a fully-equipped laboratory for analyzing and making determinations of all types of industrial hazards found in the State. Plans are being made to greatly enlarge this Industrial Hygiene Unit in order to provide greater aid to Colorado Industry in eliminating health hazards resulting from dusts, fumes, vapors, lighting, ventilation, overcrowding, fatigue, etc.

DIVISION OF TUBERCULOSIS CONTROL

The program of this division is based upon the dictum that the control of Tuberculosis depends upon proper control of bacilli-laden sputum. "Control the sputum," says Plunkett, "and the spread of Tuberculosis is prevented—neglect this measure, and cases multiply." The principal procedures, which have been instituted in order to prevent the dissemination of tubercle bacilli in Colorado are:

1. Education or information service regarding Tuberculosis for physicians, nurses, and the general public.
2. Tuberculosis case-finding clinics.
3. Segregation and treatment of all patients suffering with open Tuberculosis (this procedure is carried on by cooperation with the State Public Welfare Department and other interested organizations).
4. Public Health Nursing follow-up of all cases of Tuberculosis and all contacts.
5. Diagnostic and consultation aid to physicians.
6. Maintenance of a Tuberculosis registration file.
7. Investigation and research on Tuberculosis problems.

DIVISION OF VITAL STATISTICS

In conformity with the increasing need for accurate birth and death records the Division of Vital Statistics has been greatly enlarged during the biennium. The enlargement has involved the addition of well qualified and efficient personnel and modern equipment, including a punch card tabulating unit. With this equipment, statistical data can be tabulated and the results computed with speed and accuracy impossible by the manual methods formerly used. Statistical studies based on these data serve as a health index for the State.

FUTURE NEEDS

Although a great deal of progress has been made in the last two years, the Department of Health has been particularly handicapped for want of proper state health legislation. The present health laws of Colorado are in a chaotic state which should be remedied by immediate reorganization of the entire state health legislation. The need for reorganization is apparent when it is remembered that at present there are seven official agencies which are conducting health programs on a state-wide basis. Under such a system there is always a question of authority or lack of authority between different state departments, with resulting friction and inefficiency. Instead of a unified health program under a central authority, there is a multiplicity of programs under many departments with a resulting tendency toward overlapping, duplication, and lack of coordination. The consequence of this condition is, of course, inefficient health programs which cost an excessive amount in proportion to the results achieved in protecting the people from disease.

The immediate needs of the Division of Public Health may be summarized under the following heads:

1. Adequate public health legislation.
2. Increase of full-time health unit services to the entire State.
3. Provisions for adequate Industrial Hygiene services.
4. Expansion of mental health services on a state-wide basis.
5. Facilities for an adequate milk sanitation program.
6. Expansion of Public Health Education services.
7. Strengthening and extension of all basic public health services.
8. Additional facilities for diagnosis and hospitalization of indigent tuberculous individuals.

DIVISION OF CRIPPLED CHILDREN

MAURICE D. VEST, M.D., M.P.H.
Director

During the past two years services for crippled children have developed a great deal through the Colorado Division of Crippled Children. People all over the state have become more conscious of children with disabilities and they have a much better understanding of what can be done for such cripples. The work accomplished was possible because of the effective cooperation of the medical profession, local health departments, public health nurses, welfare agencies, many lay organizations and of numerous interested individuals. The several hospitals serving these children have put forth exceptional effort to improve their services to meet the increasing requirements for care.

A clearer understanding of this report will be obtained by reviewing the types of cripples served and the objectives of the program.

DEFINITION OF A CRIPPLED CHILD

> "A crippled child shall be considered to be a person under twenty-one years of age who has some remedial deformity or disease of the skeletal system, articulations or related structures of a chronic nature or tending toward chronicity. For purposes of this definition, harelip and cleft palate, orthodontia necessary to obtain the desired results in the case of harelip and cleft palate, and plastic surgery shall be included as crippling conditions.
>
> "In 1938 the definition was enlarged to include certain types of eye surgery such as congenital cataract, traumatic cataract, plastic on eyelids, strabismus operation, enucleation and tear sac operation."

OJECTIVES OF THE PROGRAM

The ideal of this service is to provide the maximum care required for every crippled child who would not otherwise receive adequate treatment through his parents or through some charitable organization. His defects would be corrected or minimized as much as possible so that he may face life with a maximum of physical capacity and educational equipment. He should become self sustaining and not a burden upon his family or upon his community.

REGISTER OF CRIPPLED CHILDREN

It is the desire of the Division to have all crippled children in Colorado on the register, regardless of financial status. Children in

Denver will soon be included on this register and there are many more private patients to be reported for registration.

A register of crippled children is maintained for the following purposes:

1. To provide information to determine whether or not a child has received adequate diagnosis and treatment, such information to be made the basis of a plan of service on his behalf.

2. To give information regarding educational and vocational factors, which is made available to the Director of Special Education and to the Vocational Rehabilitation Service of the State Department of Education.

3. To provide data on which to plan the program of care and to supply medical statistics for the study of crippling diseases, looking toward their prevention and eventual eradication.

As a result of the increased awareness on the part of the medical profession and local workers, of improved efficiency in the reporting of congenital defects through the Vital Statistics Division and reporting of new poliomyelitis cases through the Division of Epidemiology, the number of cases on register has increased rapidly.

TABLE I

GROWTH OF THE REGISTER

1937-1939

	1937	1938	1939
Children on Register at end of year	1028	1373	2155

Although the register contains information regarding a large number of crippled children, it shows only a portion of the true picture. Denver is not included, there are many private patients not reported and there is always a lag of a few hundred patients reported but not properly registered due to clerical limitations.

STATISTICAL ANALYSIS OF REGISTER AS OF DECEMBER 31, 1939

The register of crippled children of Colorado (exclusive of the city of Denver) on December 31, 1939, listed 2155 children or 2.9 per thousand population. These figures compare closely with the findings of the 1934 Study of the Number and Needs of Crippled Children which showed 2.5 per thousand, and with the record of 3.2 of the United States Children's Bureau for the country as a whole as of June 30, 1938*. It is considerably under the estimate of the probable number of crippled children in the country which the Children's Bureau set at 7.3 in a report of March, 1939*, an estimate based on reports of ten states with long established registers. It should be noted that the register for Colorado has not yet reached the point at which prompt reporting of disabilities and removal of cases as they become ineligible would bring a fairly static figure. It is perhaps early to predict, but from a consideration of the duration and progress of development of local services, the prediction may be ventured that this point will not be reached in Colorado for at least another year and possibly for several years. In view of the absence of widespread epidemics of infantile paralysis, it is hoped that Colorado will not reach the estimate offered by the Children's Bureau for the country as a whole.

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*Social Statistics, Supplement Number 3, March 1939, published by the Children's Bureau, U. S. Department of Labor.

ANALYSIS OF DISABILITIES

The classification of crippling disabilities given below is based on etiological factors. It follows a standard diagnostic classification adopted from the Standard Classified Nomenclature of Disease.

TABLE II

DISTRIBUTION OF CHILDREN ON REGISTER DECEMBER 31, 1939, ACCORDING TO DIAGNOSIS

	Number	Number	Per Cent
Congenital		823	38.4
Absence of Part	20		
Deformity of Joint	46		
Club feet	170		
Dislocation of Hip	118		
Dislocation (Other)	10		
Cleft Palate	48		
Harelip	27		
Harelip and Cleft Palate	75		
Spina Bifida	3		
Torticollis	13		
Supernumerary fingers	7		
Supernumerary Thumb	4		
Other (Anomalies, etc.)	56		
Exostosis	2		
Spastic Paralysis	205		
Birth Injury of Peripheral Nerve	19		
Disturbances of Innervation or of Psychic Control		501	23.1
Post Poliomyelitis	475		
Post Encephalitis	8		
Unknown	18		

	Number	Number	Per Cent
Unknown or Uncertain Causes		307	14.2
Achondroplasia	3		
Bowlegs	15		
Flat Feet	113		
Perthes Disease	33		
Muscular Dystrophy & Muscular Atrophy	19		
Scoliosis	72		
Other	52		
Trauma		221	10.2
Amputation	25		
Burns	45		
Deformity of Hip	19		
Deformity of Arm	45		
Deformity of Elbow	21		
Deformity of Foot	9		
Deformity of Forearm	1		
Deformity of Knee	6		
Deformity of Spine	12		
Deformity of Nose	1		
Deformity of Leg	14		
Other	23		
Infection		202	9.4
Arthritis	48		
Osteomyelitis	54		
Tuberculosis of Spine	26		
Tuberculosis of Hip, Knee, etc	38		
Rheumatism	3		
Known Infection	20		
Unknown Infection	13		
Disturbances of Metabolism, Growth or Nutrition		47	2.2
Bowlegs	25		
Flat Feet	5		
Knock Knees	8		
Other	9		
Eye Disabilities		29	1.3
New Growths		25	1.2
Total		2,155	100.0

DISTRIBUTION BY AGE

Age grouping which is shown by Table III follows closely the percentages for the country as a whole. In commenting on this distribution the Children's Bureau states* "comparison of the age distribution of registered crippled children with that of the entire population under 21 in 1930 shows that infants and younger children are not yet proportionately represented on the registers of crippled children." Improvement in the reporting of congenital defects and of disabilities incurred during the preschool years, as shown by experience in states where more effective reporting prevails, would indicate a probable increase in the proportions of children in the age groupings under five years.

TABLE III

AGE DISTRIBUTION OF CRIPPLED CHILDREN ON THE COLORADO REGISTER DECEMBER 31, 1939

	Children	
Age Groups	Number	Per Cent
Under 1 year	48	2.2
1 year, under 5	358	16.6
5 years, under 10	505	23.4
10 years, under 15	584	27.1
15 years, under 20	559	26.0
20 years, under 21	101	4.7
Total	2,155	100.0

DISTRIBUTION BY RACE

Table IV shows race distribution percentages. Children of Spanish-American descent are included in the classification "Other."

TABLE IV

RACE DISTRIBUTION OF CRIPPLED CHILDREN ON THE COLORADO REGISTER, DECEMBER 31, 1939

	Children	
Race	Number	Per Cent
White	1,778	82.5
Negro	13	.6
Other	364	16.9
Total	2,155	100.0

---

*Social Statistics, Supplement Number 3, March, 1939, published by the Children's Bureau, U. S. Department of Labor.

DIAGNOSIS

Wherever possible, diagnostic examinations are given in clinics conducted in the district in which the child lives. The State has been divided into eighteen clinic areas in which clinics are held at varying periods of four months, six months and one year, according to the need. Where an emergency exists or where more frequent examinations are required, examination may be arranged at the physician's office. Table V shows the extent of services rendered in this field.

TABLE V

DIAGNOSTIC SERVICES FOR CRIPPLED CHILDREN IN COLORADO

	Jan. 1, 1938 Thru Dec. 31, 1938	Jan. 1, 1939 Thru Dec. 31, 1939
Clinic areas served	8	19
Counties served	21	51
Days of clinic service	11	30
Examinations by orthopedist	388	1,152
Office examinations by specialists	332	910
Total number of examinations	720	2,062

TREATMENT

The Division of Crippled Children depends upon organizations and individuals all over the state to report children with crippling conditions. Physicians, nurses and welfare workers refer the majority of patients but lay organizations and interested individuals also play an important role. It is interesting to note that while in the earlier months of the program the majority of cases reported for treatment were children whose care had been neglected for long periods of time and whose disabilities accordingly were far advanced, in 1938 the trend began toward earlier reporting of disabilities in their incipient stages so that the real work of prevention of deformity was begun and more children cared for at a lesser expense. During 1939 the tendency to see children earlier became increasingly more evident.

Splendid cooperation in case finding and the facilities for diagnosis and medical consultation furnished by the Division of Crippled Children have brought to light a large number of children in need of medical care. Of course treatment for crippled children has been carried out for many years through various organizations and individuals but with all the present effort to secure adequate care there are still over 200 on the waiting list of the Division of Crippled Children because of the limited funds available. It is necessary to follow many of these children for a few years to be sure that maximum benefits are maintained without relapse. Thus the number of old treatment cases grows and follow-up care for these children must be given precedence over care for new patients.

Experience in states where the crippled children's program is much older than in Colorado shows that after the large group of neglected children receive maximum care with the attendant high cost of long hospitalization and extended medical care, practically all new patients are those seen soon after the onset of disability which permits shorter hospitalization, less drastic procedures, lower cost and, most important of all, a far better correction of the disability. With sufficient funds, the outlook would be very favorable and in a few years all patients would be treated soon after the disability is noted and there would be no waiting list. Such service for crippled children cannot be valued properly in dollars and cents.

Treatment provided for crippled children during 1938 and 1939 is shown statistically in Table VI.

TABLE VI

PATIENTS SERVED 1938 AND 1939 ACCORDING TO TYPES OF SERVICE PROVIDED

	1938	1939
Hospital in-patient	223	268
Hospital out-patient only	4	20
Medical supervision only (exclusive of clinics)	62	161
Diagnostic service only	37	22
Clinic consultation only	274	792
Total number of patients	600	1,263

It is interesting to note that even though the number of hospital patients was increased somewhat there was a marked increase in the number of patients served without hospitalization. The increase in the services, "Hospital Out-Patient Only" and "Medical Supervision Only," is a reflection of the early referral of patients who require less drastic treatment. The large increase in clinic service is due primarily to the necessity for careful follow-up care of patients treated in the previous year. Of course many new patients with minor disabilities require only clinic consultation.

No patients are counted twice in the statistics given but actually many receive more than one type of service, for example, there were 415 clinic visits in 1938 and 1,152 clinic visits in 1939.

TREATMENT SERVICES IN HOSPITALS AND CONVALESCENT HOMES

The analysis of types of treatment services shown below in Table VII which is based on yearly totals does not show a trend beginning to appear in the last months of 1939 in which the amount of care given in convalescent and foster homes shows an increasing proportion to the amount of hospitalization. Improvement and increase of convalescent facilities has gradually permitted reduction of the individual child's stay in the hospital. It is anticipated that further gains in this direction will reduce costs of care per child as well as make way for the treatment of an increasing number of children.

TABLE VII

HOSPITAL AND CONVALESCENT SERVICES 1936-1939

	May 15, '36 thru Dec. 31, '37	Jan. 1, '38 thru Dec. 31, '38	Jan. 1, '39 thru Dec. 31, '39	Total
Days hospitalization	15,714	23,358	23,402	62,474
Days convalescent home care	13,196	17,763	16,213	47,172
Days foster home care	274	965	288	1,527
Totals	29,174	42,086	39,903	111,173

CONVALESCENT CARE

Increased facilities for convalescent care have aided in reducing hospital costs and have improved treatment. In this program the convalescent home has very effectively cared for certain types of cases which could best be served through the institutional type of care. At the same time, the number of foster homes available in the several treatment centers has been increased. These homes are investigated and approved for use of the Division of Crippled Children by the Child Welfare Division of the State Department of Public Welfare.

PUBLIC HEALTH NURSING

Case finding and follow-up care given in the communities by public health nurses are of the most vital importance to the program. It is imperative that crippled children be followed rather closely to obtain the maximum benefits from medical care. It soon became evident that this nursing service required coordination and special supervision for greatest efficiency. Accordingly, in August 1938 an orthopedic nursing consultant was added to the staff and in March 1939 a district orthopedic nursing consultant was obtained.

An orthopedic division of the nursing manual was prepared to acquaint the public health nurses in the state with the policies of the crippled children's program and how they should function in that program. Plans were made to conduct a staff education program in orthopedics for all public health nurses in the state, to begin in January 1939 and to continue through May 1939. An attempt was made to work out a plan of reporting to nurses the information necessary for adequate follow-up service.

COORDINATION WITH OTHER SERVICES FOR CRIPPLED CHILDREN

One of the most gratifying aspects of the program has been the teamwork with which the various services rendered by the many agencies doing crippled children's work have been coordinated. It became increasingly evident that the dovetailing of medical, public health nursing, social, educational and vocational services constituted one of the most challenging phases of the program. The readiness to join hands which has been evident since the beginning of the program and the continued study of improved methods of coordination augurs well for even greater effectiveness in the program.

Relationships with the Child Welfare Division have been fostered by frequent conferences with the director and by close collaboration with the district and county supervisors. Several joint staff conferences are planned for the next year.

Similar close relationships have been maintained with the director of special education (Department of Education) to whom are referred children having special problems such as non-attendance due to lack of transportation facilities in the school district, children who may need instruction in the home and those who may be able to take advantage of speech instruction offered in several of the institutions of higher learning. Although resources of the Department of Education are most limited, the director of special education has utilized existing resources including volunteer teaching assistance. The director of special education has attended clinics where there were a sufficient number of new cases.

The Vocational Rehabilitation Service has been supplied with medical, social and educational data on crippled children eligible or approaching eligibility for assistance in vocational training. A representative of the Rehabilitation Service has attended almost every crippled children's clinic where he has a convenient contact with clients in the area. The problems of individual patients have been discussed frequently with representatives from this bureau.

ACTIVITIES OF PRIVATE AGENCIES

In 1939 the Colorado Society for Crippled Children established occupational therapy services for children in St. Anne's Convalescent Home, in foster homes under the supervision of various welfare and medical agencies and also to individual children in their own homes. Most of these patients were referred by the Division of Crippled Children. The work has been supported by memberships, contributions and by the proceeds of the annual Easter seal sale which was carried out for the second time in 1940. This past year county organizations were established in about a dozen counties and the local funds of these counties were made available for miscellaneous needs of crippled children. Although the occupational therapy program thus far has been concentrated in the vicinity of

Denver, some isolated cases have received guidance through limited supervision of the occupational therapy teachers and the utilization of volunteer services.

Al Kaly and El Jebel Temples of Shrine continue to accept and refer crippled children. Records of children who have been served or reported have been made available to the Division of Crippled Children and reports of subsequent contacts with these children have been supplied to the Shrine by the Division of Crippled Children. Both temples have received children for hospitalization from the waiting lists of the Division of Crippled Children.

Rotarians in this district which includes Colorado, Wyoming and Northern New Mexico have contributed generously to provide care for the many children who have occupied the ten to fifteen beds maintained for free service at Beth El Hospital. Most of the children have been treated for orthopedic disabilities although a few patients have received care for diabetes, eczema, chorea, or for other diseases. Some children have been taken from the waiting list of the Division of Crippled Children and local Rotary Clubs have assisted also with crippled children hospitalized by other agencies in the state. Records of Rotary patients have been made available to the Division of Crippled Children for completion of the State Register of Crippled Children and for aftercare services supplied through the Division of Crippled Children in all parts of Colorado.

State and local units of the American Legion Child Welfare have been active in providing appliances, transportation and assistance in aftercare in a child's own home. Patients have been referred from this agency to the Division of Crippled Children, but some children of ex-service men have received hospital care provided by a national fund. When such care was furnished, the American Legion made use of facilities available to the Division of Crippled Children including routine reports and aftercare services.

The Parent-Teacher Association has shown great interest in following the development of the program. Members of local units have referred patients and they have given valuable assistance in clinics. The state organization has concerned itself particularly with the educational needs of handicapped children who are greatly in need of attention.

Numerous other agencies of both state and local jurisdiction have participated. This participation usually takes the form of assistance in purchasing braces and providing transportation.

BUDGET

Under the Federal Social Security Act of August 14, 1935, funds for the care of crippled children have been made available on a matching basis to the various states through the Children's Bureau. From July 1938 to June 1940 the Division of Crippled Children has operated on funds furnished as follows:

State funds	$90,000.00
Federal funds	93,352.77

At the close of the fiscal year, July 1, 1939-June 30, 1940, it is estimated that all unexpended balances will be exhausted or encumbered. It will then become necessary to operate upon funds currently appropriated.

DEVELOPMENT OF THE PROGRAM

Each year has presented a different picture and changing trends may be noted in the nature of the services rendered. The first year and a half brought to light gross deformities in children whose treatment had been long delayed and who thereby required more drastic surgical treatment and longer hospitalization. In this first period all patients were "new," requiring more detailed study; plan of work and procedures were being established; hospitals were rounding out their services and equipment to meet the needs and local agencies were occupied in endeavoring to get other social security provisions under way. In the fall of 1937 the Division of Crippled Children was called upon to meet the first emergency, an infantile paralysis epidemic of greater proportions than the state had experienced in many years. In 1938 it became necessary to continue care for the children of this epidemic and also to consider a growing proportion of children needing less extensive types of care, as well as to provide for the "aftercare" services to children whose treatment had been begun in the earlier days of the program. By 1939 this accumulation of older patients requiring continued attention, combined with the steady flow of new cases being reported as a result of greater effort in the local communities, brought the Division of Crippled Children to the point where it was not possible to accept all children for treatment immediately on referral, thus creating a gradually increasing waiting list. The year 1938 saw the greatest financial expenditures of the period reported to meet the needs of infantile paralysis victims. The state fortunately was able to handle the extra demand because of a surplus created in 1936 when the program was gathering momentum. The year 1939 therefore brought a crisis with only the normal appropriation, a continuing load of old patients requiring extensive care and an increasing demand for minor services, the number of which offset the smaller cost.

From the beginning of the program it was realized that for some years there would be a heavy demand for the care of children with extreme deformities resulting from failure to receive treatment promptly after onset of the disabilities. It became apparent from the nature of the requirements for children on the waiting list at the close of the year 1939, as well as from the children being referred, that there was still a heavy demand for the "older" patients. It is not possible to say how long this need will continue but there is no doubt that several years at least will be required before treatment demands are strictly on a current basis.

Another interesting trend may be noted in the increasing number of children referred during the early stages of development of deformities. These children may require only brief treatment, possibly only out-patient physiotherapy, possibly braces or shoe adjustments, but they must be kept under continuous observation and must have supervision in their homes. For these children there is apt to be less appreciation in their homes of the importance of the simpler forms of treatment. The vigilance of physicians, public health nurses and community workers which is bringing these children to light is a most cheering indication that more serious deformities may be prevented.

It should not be overlooked that orthopedic patients must be kept under observation for long periods, sometimes until the child's full growth has been reached. Anyone who has seen the relapse of perfectly corrected club feet or who has observed the insidious onset of spinal curvature due to neglect of comparatively simple precautions must appreciate the extreme importance of periodic examinations.

In planning for the years ahead the Division of Crippled Children needs therefore to consider what provisions may be made for the children now awaiting treatment, to plan for an increasing number of new patients while keeping faith with the children who have already been taken under the wing of the Division's medical service and to provide adequate services for the increasing proportion of minor treatment patients, thus preventing grosser deformities and eventually reducing the need for the major forms of treatment.

DIVISION OF FOOD AND DRUGS AND RESTAURANT SANITATION

K. W. Lloyd, Ph.R.
Director

ACTIVITIES

The activities of this Division have been devoted to the enforcement of the following laws and acts:

The Food and Drugs Law of 1907
The Pure Food and Sanitation Inspection Law of 1913
The Restaurant Act of 1935
The Narcotic Act of 1935

SCOPE OF WORK

Inspections and investigations are made of food and drugs for purity, quality and standards. Samples of food and drugs are collected and analyses made by the State Chemist.

Hearings are held in cases of violation of our laws and in some cases prosecutions are instituted.

All places manufacturing, preparing or distributing food are inspected for sanitary conditions, with due consideration both as to the wholesomeness of the food produced and the health of the employees. Included are bakeries, canneries, slaughter plants, grocery and meat markets, confectioneries, bottling plants and restaurants.

The restaurant work consists in periodical inspections, issuing licenses, checking physical reports on food handlers and issuing permit cards to same.

Drug stores are checked relative to narcotic records. Complaints on narcotic violations are filed in court, and cooperation is given the Federal Narcotic Bureau on many narcotic cases.

Extensive work has been done on marihuana control.

OBJECTIVES

The major objectives of this Division may be summarized as follows: The enforcement of our laws in order that:

All Food and Drugs are manufactured, prepared or sold under sanitary and healthful conditions.

The Consumer is protected from purchasing adulterated or misbranded products.

That all persons employed in the handling of food are not capable of transmitting a communicable disease.

The control of narcotics, including marihuana, and to cooperate with the Federal Narcotic Bureau in such enforcement.

FOOD HANDLERS PERMIT CARDS

Under the Restaurant Act, food handlers are required to have a yearly physical examination, including blood specimen, which is sent by the examining physician to our State Laboratory. The physical reports and results of blood tests are then sent to the office of this Division, where the permit cards are issued.

SUMMARY

	1938	1939
Inspections made	12,360	18,737
Instructions or orders given	7,466	9,913
Restaurant licenses issued	3,203	3,457
Hearings held	13	61
Cases filed in court	10	17
Towns visited	....	1,258

Condemnations of food and drugs included tomato and celery juice, meat, epsom salts, lettuce, canned peaches, flavoring extracts, frozen eggs, cereal, tomato puree and marihuana.

Results of Kahn Precipitation Tests performed on food handlers in the State of Colorado are as follows:

1938

	Negative	Positive	Positive Under Treatment
Denver	19,728	627	435
State	18,128	362	140
Totals	37,856	989	575

1939

	Negative	Positive	Positive Under Treatment
Denver	17,573	286	190
State	21,490	238	91
Totals	39,063	524	281

DIVISION OF LABORATORIES

WILLIAM C. MITCHELL, M.D.
Director

The magnitude of the work done by the Division of Laboratories of the Colorado State Board of Health is shown in the following summary of the results of specimens examined in 1938 and 1939:

DIAGNOSTIC EXAMINATIONS, 1938

	Results			
Type of Examination	Neg.	Unsat.	Pos.	Total
Kahn Precipitation Test	70,506	1,113	5,009	76,628
Gonococcus	3,338	23	505	3,866
Diphtheria	3,511	180	760	4,451
Virulence Tests	4	0	11	15
Widal	226	2	27	255
Para A	41	0	2	43
Para B	43	0	0	43
Abortus	256	3	7	266
Tularemia	33	1	4	38
Proteus X-19	8	0	0	8
Vincent's Angina	28	1	71	100
Stool for Amoeba	1	0	0	1
Stool and Urine for Typhoid	112	1	4	117
Stool for Worms	1	0	0	1
Blood Cultures	6	2	0	8
Meningitis, Spinal	16	2	3	21
Relapsing Fever	1	1	0	2
Sputum for Tuberculosis	254	3	24	281
Spermatozoa	3	0	0	3
Spirochaeta Pallida	4	0	0	4
Paul Test for Smallpox	1	0	0	1
Rabies	3	0	0	3
Culture from Abscess	3	0	1	4
Botulism	4	0	1	5
Pleural Fluid	2	0	1	3
Pneumococcus Typing (Sputum)	55	0	70	125
Pneumococcus Typing (Spinal)	0	0	1	1
Water for Potability	916	0	370	1,286
Total	79,376	1,332	6,872	87,580

DIAGNOSTIC EXAMINATIONS, 1939

Type of Examination	Results			
	Neg.	Unsat.	Pos.	Total
Kahn Precipitation Test	93,143	1,491	5,085	99,719
Colloidal Gold (March-December)	45	1	26	72
Spirocheta Pallida	5	0	0	5
Gonococcus	3,151	8	625	3,784
Diphtheria	2,982	201	404	3,587
Virulence Test	1	0	0	1
Agglutinations				
Widal	248	5	17	270
Para A	43	0	0	43
Para B	43	0	0	43
Abortus	387	2	7	396
Tularense	52	1	13	66
Proteus X-19	17	0	0	17
Sputum				
Tuberculosis, direct smear	402	4	53	459
Tuberculosis, culture (March-December)	289	4	61	354
Pneumonia Typing	218	1	569	788
Vincent's	45	0	52	97
Feces for Typhoid	68	3	3	74
Feces for Parasites	7	0	0	7
Urine for Typhoid	1	0	0	1
Blood Cultures	12	0	1	13
Spinal Fluid for Meningococcus	12	0	0	12
Cultures for Meningococcus	4	0	0	4
Cultures for Botulinus	5	0	0	5
Cultures for Streptococcus	3	0	2	5
Rabies	1	0	Doubtful	2
Water for Potability	939	0	421	1,360
Miscellaneous				
Culture for tetanus, ear smears, milk smears for streptococcus, milk, actinomyces, monilia, malaris, spermatozoa, ducrey, smear for fistula for Tuberculosis, animal inoculation for urine for Tuberculosis, eye smear for pathogens	13	0	3	16
Total	102,136	1,722	7,343	111,200

	Pos.	Total
Food Handlers' examinations	2,956	40,115
Prenatal examinations (Sept. 14 to Dec. 31, 1939)	53	4,683
Premarital examinations (Sept. 27 to Dec. 31, 1939)	44	2,973

DIPHTHERIA

The laboratory of the Colorado State Board of Health began pioneer work with the Bacteriological aspects of diphtheria in 1895, and this work was carried out both intensively and extensively for four years, i.e., for the years 1895, 1896, 1897 and 1898. An exhibit of early pioneer work done by the Laboratory on diphtheria was given a certificate of Honorable Award at the Sixty-eighth Annual Session of the Colorado State Medical Society, held at Estes Park, Colorado, in September, 1938. The following tables compiled from the 4 years' statistics give valuable information as to the time the Klebs-Loeffler bacillus may persist in the throats of children after all symptoms have disappeared.

Year	Shortest Time	Longest Time
1895	5 days	*62 days
1896	5 days	*51 days
1897	5 days	*74 days
1898	5 days	*75 days, *95 days, *145 days

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*All of these long drawn out cases were virulent by guinea pig test.

Yearly Average in Days		Number of Positive Cases from Which Yearly Average Was Computed	
1895	19.11	1895	224 cases
1896	16.89	1896	184 cases
1897	24.02	1897	192 cases
1898	27.48	1898	277 cases

Average of 4 years 21.87 days

Average of the four years gives 21.87 days and as a result 3 weeks was made the length of time for quarantine. Pressure of public opinion, however, has reduced this to two weeks.

One of the most important features of this pioneer diphtheria work was the systematic examination of the throat and nose of all children before admittance to the State Home for Dependent Children and other like city and state institutions. It is believed that this laboratory was the first to sponsor this class of work in the United States. This work has been carried out in these institutions since that time with the remarkable results of no epidemics of diphtheria where these rules have been enforced.

PNEUMONIA

During the latter part of November, 1938, a new service was commenced, namely, the Neufeld method of typing pneumococci. This was made possible by the United States Government, establishing four centers in the United States for research on this type of work. At the request of Dr. R. L. Cleere, one of the stations was established in Denver and in the laboratory of the Colorado State Board of Health.

The technique of typing pneumococci by the Neufeld and mouse inoculation methods, as used in this Laboratory follows:

NEUFELD METHOD requires the use of rabbit typing serum because it causes the formation of broader, more strongly refractive layers around cocci than the antisera produced in horses.

TECHNIC: Mark slide in center with patient's name and combination or type at each end of slide. Always set up Combination A (types I, II and VII) first and examine for pneumococci. Place small amount of sputum using 1 mm. loop on slide or cover slip; then add one loopful of typing serum (4 mm.) and a loopful of Loeffler's methylene blue using the same loop as for the typing serum. It is very important that the preparation be stained satisfactorily. It does not matter if sputum or peritoneal fluid dries but it is important that, upon addition of serum and stain, the preparation does not dry up. Cover slip should be placed on slide immediately and pressed down. Preparation should be mixed thoroughly.

If no organisms can be found in the first preparation (or very few organisms) repeat using two loopfuls of sputum and two loopfuls of serum. It is necessary that dilution of sputum and serum remain the same.

APPEARANCE OF POSITIVE REACTION: If types I, II or VII are present, a positive reaction will appear in combination A. There will be pronounced swelling of capsules of the pneumococci. In a negative reaction, the capsules of pneumococci will be their usual size and barely visible.

Set up all combinations even if one type is found as it is possible to have more than one type in a specimen. Examine all individual types in a combination (which has positive reaction) as two types may be found in same combination. If specimen is negative by direct Neufeld typing, report no reacting pneumococci. If positive, report type.

MOUSE INOCULATION: If specimen is negative by direct Neufeld, inject ¼ cc. of sputum (fluids ½ cc.) intraperitoneally into white mouse (weight 15 to 22 grams) directly by drawing into barrel of syringe then inserting needle. Label mouse box with name of patient, time of inoculation and date. Three to five hours after inoculation, examine mouse and puncture abdomen with small capillary pipette and obtain small drop. Set up with combination A using straight wire instead of loop for peritoneal fluid and examine for organisms. If present, set up rest of combinations. If there are no organisms present repeat at end of two hours. If still no organisms present, examine at the end of another two-hour interval or allow to go over night and examine in the morning. If mouse is still alive and no organisms are found, allow to live for five days and if still living at that time, kill with chloroform and autopsy. When mouse dies or is killed, make small incision in peritoneum with scissors (which have been sterilized with alcohol and flaming) and using straight wire set up Neufeld. Also streak blood agar plate. Inoculate heart's blood into blood phosphate broth and blood agar plate.

MEDIA FOR GROWTH OF PNEUMOCOCCUS

CULTURE MEDIA:

Dissolve 50 grams beef heart for infusions (dried) in 1000 cc. water. Add 1.0% neo-peptone and 0.2% disodium phosphate with 0.5% sodium chloride. Dissolve by boiling with broth. Adjust reaction to pH 8.1 to 8.3 with sodium hydroxide. While the reaction is being adjusted, keep broth at boiling point to bring down precipitate. Final reaction should be 7.4 to 7.7. Filter through paper while hot. (Cotton is sometimes placed below paper to keep it from breaking.) Tube or bottle and sterilize in autoclave at 15 lbs. pressure for one-half hour. (The solution of beef heart and water should contain 1.2 to 1.5 mg. of total carbohydrate.)

BLOOD BROTH:

Add 3% blood (citrated) to the phosphate broth.

AGAR:

4% agar added to phosphate, autoclaved, filtered through cotton, reaction readjusted to pH 8.1 to 8.3, autoclaved. When preparing blood agar, melt and cool to about 50 degrees, add 3% blood, mixing thoroughly, and pour plates, flaming the mouth of the flask.

BLOOD CULTURES:

When blood cultures are made, it is essential that the blood be added to suitable broth and mixed thoroughly to prevent clot formation as soon as it is drawn, and that the culture be either incubated immediately or stored at a temperature between 8 and 15 degrees centigrade until it can be incubated. Broth cultures should be observed at intervals for growth which may occur in from 12 hours to 3 days. When growth occurs, type may be determined by the Neufeld reaction. Care should be taken that too much blood is not used —up to 2 cc. for 50 cc. of broth, or 1 cc. for 25 cc. of broth is adequate. Much more prognostic value is attached to blood cultures made in poured blood agar plates from which the degree of bacteremia may be estimated and followed.

The laboratory diagnosis of pneumonia by the Neufeld method of typing, by culture and by mouse inoculation, as practiced by the laboratory, has been increasingly used by the medical profession throughout the year.

Results of Pneumococci Typing, 1939

One Type

Type	No.	Type	No.
I	87	XVIII	15
II	99	XIX	19
III	66	XX	11
IV	18	XXI	3
V	11	XXII	4
VI	18	XXIII	8
VII	35	XXIV	7
VIII	22	XXV	4
IX	10	XXVI	0
X	17	XXVII	3
XI	10	XXVIII	3
XII	5	XXIX	9
XIII	9	XXX	0
XIV	8	XXXI	5
XV	7	XXXII	2
XVI	7	XXXIII	0
XVII	5		

Two Types

Type	No.	Type	No.
I & V	1	VII & X	1
I & X	1	VII & XVI	1
I & XIII	1	VII & XXIV	2
I & XXV	1	IX & XII	1
II & X	1	X & XIX	1
II & XI	1	X & XX	1
II & XVII	1	X & XXVIII	1
II & XVIII	1	XI & XVI	3
III & VII	1	XI & XVIII	1
III & XI	1	XII & XXI	1
III & XX	1	XIV & XIX	1
V & XVII	1	XVII & XXIX	1
V & XX	1	XVIII & XXXII	1
VI & XVII	1	XX & XXIV	2
VI & XVIII	1	XX & XXIX	1
VI & XXII	1		

Three Types

Type	No.	Type	No.
III, VII & XX	1	VIII, XV & XXIII	1
III, XI & XVI	1	XI, XVI & XIX	1
VII, XIII & XVII	1	XV, XXI & XXIX	1

Number of mouse inoculations	374
Number of sputa examined	750
Number of spinal fluids examined	9
Number of blood cultures examined	4
Number of pharyngeal swab cultures examined	14
Number of pleural fluid cultures examined	17
Number of cultures from other sources examined	2
Number of positive pneumococcus typings	576
Number of negative pneumococcus typings	220
Grand Total	796

Summary of Specimens Examined for Pneumococci in Connection with Pneumonia Survey from November 14, 1938, to June 19, 1939.

	Positive	Negative	Total
Pneumococcus typing (sputum)	328	203	531
Pneumococcus typing (spinal fluid)	7	0	7
Total	335	203	538
Mouse inoculations (pneumococcus typing	56	47	103

Thirty-two technicians were trained in pneumococcus typing methods; 21 from Denver hospitals and 11 from out-of-town hospitals and laboratories.

Twenty-eight specimens that were negative on direct examination by the Neufeld reaction were positive by mouse inoculation.

Seven specimens that were positive by direct examination by the Neufeld reaction were negative by mouse inoculation.

When our pneumococci typing service was begun, stress was placed on the importance of an early examination of the sputum before autolysis interfered with type determinations. Two or three hours after expectoration was given as the desirable time for examination.

A study of the relationship between the time of expectoration of the specimen and its receipt and examination in the laboratory, to the demonstration of the capsule (Neufeld) follows:

	Examined Day Collected			Examined 24 Hours After Collection			Examined 48 Hours After Collection		
	Pos.	Neg.	Total	Pos.	Neg.	Total	Pos.	Neg.	Total
Sputum	106	49	155	149	78	227	61	29	90
Spinal fluid	3	....	3	3	....	3	1	....	1

	Examined 4 Days After Collection			Examined 5 Days After Collection			Examined 6 Days After Collection		
	Pos.	Neg.	Total	Pos.	Neg.	Total	Pos.	Neg.	Total
Sputum	9	5	14	1	3	4	4	1	5

	Examined 7 Days After Collection			Examined 12 Days After Collection			— Total —		
	Pos.	Neg.	Total	Pos.	Neg.	Total	Pos.	Neg.	Total
Sputum	0	2	2	2	....	2	351	180	531
Spinal fluid....	....	....	....	....	....	....	7	....	7

It has been shown by different observers that in highly buffered fluids containing blood serum, viability and virulence of pneumococci may be demonstrable for as long a period as six months after expectoration. It has also been shown that in dried sputum, pneumococci remain viable for several days.

We believe the above observations are the first to be made on the length of time after expectoration that the Neufeld typing method may be used successfully—twelve days was the limit of our observation. It was further evinced that the pneumococci in many of these sputa remained viable up to seven days, by either mouse inoculation or culture or both.

This should not be taken as a license to delay sending in of specimens as they should be sent as early as possible, but circumstances may arise in which the examination of a belated specimen is of great importance.

A room, fully equipped with the latest laboratory facilities, was added to the laboratory in September, 1938, at considerable expense. This room is used for diphtheria work, pneumonia typing, general bacteriological work, and for the cultivation of the tubercle bacillus directly from the sputum. Owing to lack of space this room is also used for the housing of laboratory animals—guinea pigs, mice, and rabbits.

Tuberculosis

One of the most important of the new services undertaken by the laboratory was the examination by culture of all sputums sent in for tuberculosis. There has been a demand for this work for some time but it was not until this year (1939) that funds for this purpose became available. The service has proved to be most valuable and popular.

The technique of tubercle bacilli cultivation used in this laboratory follows:

One cubic centimer of suspected material is beaten to a homogeneous pulp and introduced into a sterile centrifuge tube of 15 cc. capacity with 1 cc. of 5 per cent pure oxalic acid (by weight). After incubation at 37 degrees C. for thirty minutes, agitating the tube slightly every five minutes, the contents of the tube is mixed with about 10 cc. of sterile 0.85 per cent sodium chloride solution and centrifuged at high speed. The clear supernatant solution is decanted, and another 10 cc. of sterile saline added, the sediment mixed with it with a sterile platinum loop, and the whole is again centrifuged at high speed. After this second washing with saline, the supernatant fluid is carefully decanted and the residue is seeded lightly on the surface of three tubes of egg yolk-water-glycerol medium. The tubes are incubated over night in a slanted position to permit adhesion of the bacilli to the surface of the medium, the cotton stoppers are then flamed and the top of the plug is inserted about one-fourth of an inch below the mouth of the tube. Two cubic centimeters of hot sterile paraffin solution is then poured on top of each cotton plug and the tubes are then sealed with new cork stoppers. Respiration can take place through the paraffin and cork stopper, but evaporation is practically eliminated. The tubes are then incubated in a tightly sealed can. The use of the can prevents exposure to the light, minimizes evaporation and helps maintain a still more constant temperature. Ten to fourteen days is the usual time of incubation, but the cultures should not be called negative under six weeks. If kept for stock cultures, they should be transferred every four weeks.

EGG YOLK-WATER-GLYCEROL MEDIUM

Weigh and record the weight of a 500 cc. graduate. Place one dozen eggs in 70 per cent alcohol for about ten minutes to sterilize the shells. Remove the eggs from the alcohol and dry with a sterile towel. Rubber gloves should be worn in handling the eggs. Break the eggs into a sterile one liter flask, separating and discarding the whites and using only the yolks. Break up the yolks by shaking vigorously, then pour them into the weighed graduate through a double layer of sterile gauze. Weigh the graduate again. The difference of the first weight and the second weight represents the weight of the yolks. Divide the weight of the yolks by 3, add that many cubic centimeters of sterile distilled water to the yolks (the mixture now equals—yolks 75%, water 25%). Multiply the combined weight of the yolks, plus the volume (in cubic centimeters) of water, by 0.03. Add that many grams of glycerol to the mixture. The volume now consists of yolk 73.5 per cent, water 23.5 per cent, and glycerol 3 per cent. In order to make the detection of colonies easier add 1 cc. of a 2 per cent Congo red solution (aqueous) to each 100 cc. of the mixture (making 0.02 per cent of the dye). The medium as thus made does not require an adjustment of pH.

The medium is tubed by means of a sterile salvarsan or similar dispensing tube, and the tubes are sterilized in a slanting position.

Fractional sterilization may be used if desired as with an Arnold steam sterilizer, but the method used in the laboratory of the Colorado State Board of Health is the same as for sterilizing diphtheria media, that is in an autoclave.

After steam has been generated, racks containing the tubed medium are placed in the autoclave and after the chamber is filled with steam, close all valves first and then the door. Raise steam slowly up to 15 pounds and hold for one hour. Thus coagulation of the medium and sterilization are accomplished at a single blow. Turn off gas and let cool. Do not open door until the apparatus is cool, as changing the pressure too suddenly may blow the media. Place the tubes in upright position in ice box for an hour. This allows water of condensation to gather in the bottom of tube and makes for moist media.

The egg medium shows a growth usually in from 10 days to 3 weeks, being considerably quicker than the potato medium. With some strains the growth is more luxuriant than on potato. while the reverse holds true with other strains. The experience of several workers with the culture method as opposed to the guinea pig method has been in accord. In comparing the new culture method with the guinea pig method it may be said that (1) they are of equal delicacy, when the guinea pig is positive, the culture is also positive; (2) they are of equal speed if, following subcutaneous injection in the guinea pig, local gland involvement and hypertrophy is accepted as an index in the guinea pig; (3) neither will directly differentiate human from bovine tubercle bacilli, and (4) either method destroys undesirable contaminators and nonpathogenic acid-fast bacilli, leaving only pathogenic tubercle bacilli to thrive and develop.

The two outstanding disadvantages in the use of the guinea pig as compared to the culture tube are: (1) the guinea pig is an indirect diagnostic criterion revealing only tuberclous disease which as such may at times be confused with other spontaneous infections in these animals; (2) the guinea pig possesses the decided possibility of developing tuberculous disease from extraneous sources vitiating its definite value considerably. In addition, the cultural method possesses the advantage of economy, requiring only an incubator and a centrifuge, and makes immediately accessible a culture for differentiating human from bovine bacilli, should this be desired, while a culture must first be obtained for this purpose if the guinea pig is used as a test, and if generalized disease in the guinea pig is used as a criterion of a positive diagnosis, the culture method, revealing tubercle bacilli, becomes positive several weeks earlier.

It is suggested that in trying out this medium three samples of sputa be first selected, the first of which shows upon direct microscopic examination innumerable tubercle bacilli in each field; the second of which shows a moderate number, and the third of which shows very, very few bacilli. In this way the technique can be perfected in a very short time. If good results are obtained without any difficulty in these preliminary orientation tests, one can then go after material which is suspected of containing tubercle bacilli, but which does not show any on direct microscopic examination. An astounding number of cases of this sort can be diagnosed by the cultural method.

SYPHILIS

There has been a great increase in the number of specimens sent to the laboratory for the serological diagnosis of syphilis. Food handlers, premarital and prenatal blood tests are now required by law in Colorado. These three classes of examinations account for approximately 50 per cent of the serological work. The other 50 per cent are specimens taken in routine clinical work, the total examinations for the year 1939 was 99,719.

The Kahn test is used as a standard in this laboratory. In addition, beginning in March, 1939, we introduced a ''screen test'' in our serological work. The following is an extract from an article by the Director of the laboratory. This article will be published in the *Rocky Mountain Medical Journal* and is printed with permission of that journal.

''In 1928 Kahn introduced, along with his Standard three-tube test, his so-called Presumptive Procedure. This was developed by Kahn as a more sensitive method than his standard test and used as a check on weak and doubtful reactions. It also plays an important role in the matter of establishing the value of a negative diagnosis of syphilis when the test is negative. Because of its highly sensitive reaction it would surely demonstrate any syphilitic reagin present in the specimen. Kahn emphasizes that the Presumptive Procedure should *not* be used as a diagnostic method unless used in conjunction with the standard test. As Dr. Kahn speaks with the voice of authority in this matter his own words are given as to the advantages of the Presumptive Procedure.*

> '' '1. As a technical check on the regular Kahn test. Any method carried out by human hands is subject to technical error. By re-examining all sera with the presumptive procedure after they have been examined with the regular test, obviously the number of technical errors would be reduced to a minimum.'

''In his earlier work, Kahn used a 15:1 proportion of serum to antigen. In his later work this proportion has been changed to 6:1 proportion of serum to antigen, i.e. 0.025 cc. antigen with 0.15 cc. serum.

''Instead of using one tube of the above proportions as was advocated by Kahn it occurred to me that the scope of the Kahn test might be considerably broadened and its results made more stable by the use of three tubes in the Presumptive Procedure just as is done in the Standard Kahn test but with the difference of having the antigen used in this test sensitized several points higher than the Standard test, holding at the same time to the 1:3, 1:6, and 1:12 dilutions of serum and antigen.

''Accordingly and at my request in March, 1939, the serological division began the making of a more sensitive antigen than the

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*Kahn, R. L., *The Kahn Test*, Baltimore, Williams & Wilkins Co.

Standard Kahn. The method used was to test the sensitivity of various bloods in blocks of twenty, using the readings obtained with a standard antigen as a standard from which to evaluate a higher sensitivity. At first we hit on making this 8 points higher than the standard. This, however, was found to be slightly too sensitive and was gradually lowered until we reached a level at from 5½ to 6 points higher than the standard Kahn and this gave us practical results.

''Usage has fixed the term 'screen' to the use of an antigen which is more sensitive than that used in a Standard test. In our routine work, in which from 300 to 400 or more bloods are examined daily, we first run all bloods with this carefully checked antigen, known as our 'screen antigen' and which, as said before, is standardized to from 5 to 6 points higher than the Standard.

''This test surely selects all bloods that are positive and may select a few that read doubtful or slightly positive. All these screened out bloods are then re-run with the Kahn Standard three-tube test. All bloods showing negative with this test are then considered and marked as negative. We have used this method up to date on over 175,000 bloods with the most gratifying results. It seems to have stabilized our entire technique.

''As a concrete example, in the preparation of the 'screen antigen' we take an antigen that has satisfied the requirements as to both titre and sensitiveness for the Standard Kahn. We then further sensitize this antigen to a higher point by the use of cholesterolized alcohol and if necessary the additional use of sensitizing reagent checking and rechecking as the procedure progresses until it reaches the desired point, i.e., about 6 points above standard.

''Below is given a table showing the readings of the Standard Kahn and the screen test evolved in our laboratory. It will be noted that the screen test antigen is just 6 points higher than the Standard and thus conforms to our requirements.

STANDARDIZATION OF ANTIGENS FOR SCREEN TEST ANTIGEN

Standard Kahn Antigen— Titre 1:1.2					Screen Test Antigen— Titre 1:1.3				
Serum	Reading			Total	Serum	Reading			Total
1	0	½	2	2½	1	0	1	2	3
2	1	4	4	9	2	1	4	4	9
3	0	0	0	0	3	0	0	0	0
4	0	0	1	1	4	0	½	2	2½
5	1	2	3	6	5	1	2	3	6
6	4	4	4	12	6	4	4	4	12
7	3	2	1	6	7	2	1	0	3
8	0	1	1	2	8	½	2	3	5½
9	0	3	4	7	9	1	4	4	9

STANDARDIZATION OF ANTIGENS FOR SCREEN TEST ANTIGEN —Continued

Standard Kahn Antigen— Titre 1:1.2					Screen Test Antigen— Titre 1:1.3				
Serum	Reading			Total	Serum	Reading			Total
10	2	3	3	8	10	2	3	3	8
11	½	2	4	6½	11	1	2	4	7
12	0	0	1	1	12	0	0	2	2
13	0	1	3	4	13	0	1	3	4
14	0	0	0	0	14	0	0	0	0
15	0	3	3	6	15	1	3	3	7
16	1	3	4	8	16	2	3	4	9
17	4	4	4	12	17	4	4	4	12
18	4	4	3	11	18	3	1	0	4
19	0	2	3	5	19	1	3	4	8
20	0	2	3	5	20	1	2	4	7
			Total........	112				Total........	118

0—Negative
½—Doubtful
Figures—+, ++, +++, ++++

"This method of procedure is only possible in laboratories which make and standardize their own antigens and the antigen is the heart of any test. It may be that if this method becomes popular, commercial houses might put such a sensitized 'screen antigen' on the market."

In conclusion, it may be remarked that there has been a tremendous increase in the activities of all branches of laboratory work. This is especially true of the work in diphtheria, pneumonia, tuberculosis, typhoid fever and in the serology of syphilis. This work will still further increase, since the enactment of laws requiring blood tests on all pregnancy cases and of both parties entering into a marriage contract and on all food handlers. The examinations for syphilis reached a total of 99,719 for the year 1939.

There are two indispensable conditions in laboratory work. First, that the routine of the laboratory should be such that examinations are made and reported on as expeditiously as is consistent with accuracy and, secondly, it is absolutely essential that all laboratory work be done by personnel of the highest possible standards of integrity and ability so as to command the confidence and respect of the medical profession. This is only possible when sufficient funds are forthcoming for the employment of a capable and well trained personnel, and when adequate provisions are made for the daily requirements of the laboratory.

This lack of funds has seriously hampered the full development of the laboratory for many years. The outlook has been brighter since the advent of federal funds and it is hoped that this is but the beginning of a recognition of finances for this important problem.

It is our belief that the bacteriological and serological laboratory is the foundation on which any modern department of health must rest. This laboratory needs double the space now used and there are other services still awaiting development, such as the cultural method of all gonorrheal specimens.

Acknowledgment is made of the loyalty and devotion of the entire staff of the laboratory, and of the interest of the members of the State Board of Health and of the executive secretary, Dr. R. L. Cleere, who have made possible an increase in laboratory funds.

DIVISION OF MATERNAL AND CHILD HEALTH

J. BURRIS PERRIN, M.D., C.P.H., *Director*

THE PROGRAM

By way of review the maternal and child health program includes the following:

1. Clinics—Prenatal, well-baby, immunization and sight conservation.
2. Home nursing delivery service in Las Animas, Otero and Weld counties.
3. Dental health activities.
4. Maternal and infant mortality studies.
5. Postgraduate courses in obstetrics and pediatrics for physicians.
6. Inspection and licensure of hospitals, maternity and convalescent homes.
7. Education through health talks, newspapers, radio, motion pictures, exhibits, etc., and through the rendering of actual services.

1. CLINICS

During the years 1938 and 1939 prenatal and well-baby clinics were conducted in ten counties, with a total of nine prenatal and eighteen well-baby clinics established.

These figures do not include such populous counties as Denver, Pueblo, Boulder and Larimer, where clinics of this type are conducted but not under the supervision of the Division of Maternal and Child Health.

In this two-year period the following immunization materials were provided:

	1938	1939
Diphtheria Toxoid (alum precipitated)	19,210 doses	34,850 doses
Diphtheria Toxoid (Ramon)	1,553 doses	937 doses
Diphtheria Anti-toxin	464 doses	401 doses
Smallpox Vaccine	25,097 doses	33,441 doses
Typhoid Vaccine (Complete Immunizations)	2,254	3,857
Silver Nitrate Ampules 1%	13,228	13,686

Sight conservation clinics were held in Gunnison, Baca, Morgan and Routt counties. Five hundred and seventy-five children attended the diagnostic sections, while one hundred and ninety-one were eligible for refraction by the attending ophthalmologists. These clinics have been well received, and this part of the maternal and child health program will undoubtedly show considerable expansion in the next few years.

2. HOME NURSING DELIVERY SERVICE

Home nursing delivery service is being conducted in Las Animas, Otero and Weld counties. This service has been operating for three years in Las Animas county, eighteen months in Otero county and nine months in Weld county. Altogether, public health nurses have assisted physicians in 857 deliveries during the years 1938-39. All of these nursing delivery services are parts of a more generalized public health nursing program in their respective communities.

Public health nurses are located in thirty-seven of the sixty-three counties in the state where such activities as school health, nutrition, immunization, sanitation, dental hygiene, crippled children, tuberculin testing, well-baby, prenatal and post partum clinics and visits round out the public health program.

3. DENTAL HEALTH ACTIVITIES

In the spring of 1938 the Division of Maternal and Child Health conducted a dental clinic in cooperation with the Colorado Springs Dental Society for the children of Woodland Park.

Woodland Park is an isolated valley, approximately 40 miles from Colorado Springs, which does not have the services of a dentist. A severe epidemic of trench mouth occurred and assistance was asked in controlling it. Two dentists were sent from Colorado Springs to examine all the children, and found their mouths to be in a condition of extreme neglect. Consequently, it became necessary to transport 178 children to the offices of local dentists in Colorado Springs for treatment.

This epidemic brought about the realization of the need of a regular statewide dental program. Therefore, the Division of Maternal and Child Health has now sent a dentist away (January 1, 1939) for one full year's training in public health.

The full-time statewide dental program will actually be started January 1, 1940.

4. MATERNAL AND INFANT MORTALITY STUDIES

(See Supplement as compiled by the Division of Vital Statistics.)

5. POSTGRADUATE COURSES

In both 1938 and 1939 the Division of Maternal and Child Health sponsored an obstetrician and a pediatrician on the program of the mid-winter clinics as conducted by the Colorado State Medical Society. Lectures, clinics and open discussions were given by these visiting specialists.

6. INSPECTION AND LICENSURE OF HOSPITALS, MATERNITY AND CONVALESCENT HOMES

In the spring of 1939 the rules and regulations governing the licensure and supervision of hospitals, convalescent and maternity homes were revised, and a full-time inspector and advisor appointed to this service. As a result, the licensing of these institutions is now being brought up to date. The City and County of Denver conducts its own inspection service, and the State Board of Health licenses Denver hospitals, convalescent and maternity homes upon satisfactory recommendation of the Denver Health Department.

7. HEALTH EDUCATION

Approximately 100,000 pieces of literature on health subjects were distributed over the state during the years 1938-39. Numerous health talks were given to medical societies, public health councils and other lay groups. Health education was stressed also by means of motion pictures, radio talks, and health exhibits at medical and dental meetings, county fairs and meetings of women's clubs.

DIVISION OF PLUMBING

Irving A. Fuller, *Chief State Plumbing Inspector*

The duties of this division are to examine, as provided by law, as to the fitness and qualifications of all persons applying for a license to engage in the business, trade or calling of a master or journeyman plumber, and to certify the results thereof to the Colorado State Board of Health.

State Plumbing Code

It is very gratifying to report that few instances are noted where violations were made in the code by licensed plumbers. These few cases were probably due to misunderstanding or were caused by building construction rather than through willful violation.

When installations were made on permits issued to owners, as provided by law, there were very few instances were the code was complied with and, in many cases, the entire installation has had to be replaced. In our opinion, the issuance of permits to owners is poor practice.

The provision of the code relating to grease traps was amended in December by adding an addenda giving local ordinances supervision over their installation when installed in conjunction with sanitary sewerage.

Examinations

The Examining Board is composed of the following members: Irving A. Fuller, representing State Board of Health; D. F. McFarlane, master plumber; Robert M. Street, journeyman plumber.

The Examining Board meets twice a year, May and November, in regular session. Between regular examination dates, special examinations are given to master plumbers. At the discretion of the board, special examinations may be given to journeymen plumbers.

May			November		
	1938	1939		1938	1939
Master Plumbers	8	15	Master Plumbers	8	9
Successful	6	6	Successful	5	4
Unsuccessful	2	9	Unsuccessful	3	5
Journeymen Plumbers	25	32	Journeymen Plumbers	23	29
Successful	15	25	Successful	10	17
Unsuccessful	10	7	Unsuccessful	13	12

Special examinations were given between regular examinations as follows:

Master Plumbers

	Applicants		Successful		Unsuccessful	
	1938	1939	1938	1939	1938	1939
January	1	3	1	3	0	0
February	3	0	2	0	1	0
March	1	0	1	0	0	0
June	1	0	1	0	0	0
July	1	1	0	1	1	0
August	0	1	0	1	0	0
September	0	1	0	0	0	1
October	0	1	0	1	0	0
December	1	2	1	2	0	0

Journeymen Plumbers

	Applicants 1939	Successful 1939	Unsuccessful 1939
July	3	2	1
August	1	1	0
November	5	4	1
December	1	1	0

The number of licensed master and journeymen plumbers in the state in 1938 and 1939 were:

Year	Master Plumbers	Journeymen Plumbers
1938	352	380
1939	395	419

FIELD ACTIVITIES

This work consists of inspection of plumbing, installations both new and old, applicable to all buildings outside cities of the first class, to ascertain whether the provisions of the state code have been, or are being, complied with.

Law enforcement is included in field activities. During the two-year period, fifteen cases were tried and convictions secured in all instances.

Investigation of complaints is also included in the scope of field work and, in most cases, consists of improper installations by persons other than licensed plumbers and by owners of property. It has been found that in about 90 per cent of the installations by owners, the work does not comply with the State Plumbing Code; in most cases a serious health hazard exists. The statutory provision giving an owner the privilege of doing his own work is seriously abused and the act should be repealed, especially where the plumbing system is served by any water supply used by another person or persons.

The entire state was covered with the exception of the extreme eastern portion and the La Plata and Montezuma valleys. These districts were not visited on account of the fact that one person cannot completely cover the entire state in one year's time.

In company with members of the State Board of Health, an inspection of plumbing was made at the Colorado State Hospital, State Penitentiary and State Reformatory. Conditions at the hospital and penitentiary were found in good shape except in a few minor instances. At the reformatory, many changes should be made, plans for some of which are now in the architect's office.

Through efforts and advice from this office, a large number of cross-connections have been eliminated and special mention is to be made of the ones as applied to frost-proof closets. A great many privies have been replaced with sanitary water closet combinations in newly constructed sewerage systems. Grand Junction is in the lead in this matter, closely followed by Rocky Ford, Manzanola and La Salle. A great deal of help has been given by the sanitary inspectors of the county health units in Otero and Weld counties.

SUMMARY OF INSPECTION ACTIVITIES

	1938	1939
Miles traveled by auto, bus and train	12,158	16,548
Permits issued	2,185	2,252
Inspections made	1,474	1,630
Complaints investigated	157	188
Alterations ordered	70	43
Prosecutions	7	8
Convictions	7	8

FINANCIAL STATEMENT

	1938	1939
Receipts	$ 9,532.75	$10,719.39
Expenditures	5,741.57	5,995.51
Balance	$ 3,791.18	$ 4,723.88

OFFICE WORK

Office work consists of answering correspondence other than routine; assisting in the preparation of examination questions (all examinations are given in Denver at the State Office Building); acting as a member of the Board of Examiners; collection and disbursement of all moneys pertaining to the division; passing upon all licenses and certificates of competency; keeping a permanent record of all permits issued and inspections made; approving plans and specifications of public, semi-public and private buildings at the request of architects and owners; acting as chairman of the State Apprentice Board in cooperation with the State Board of Vocational Education.

FUTURE OBJECTIVES

1. To continue our present work and cooperate with all state and local departments and agencies which have similar functions.
2. To obtain a general compliance with all laws and regulations pertaining to this division.
3. To promote plumbing apprentice training by cooperating with local and state vocational schools.
4. To advise on all matters pertaining to plumbing.

NEEDS OF DIVISION

In every report submitted we have stressed the need of two full-time deputy plumbing inspectors. The need for these inspectors grows every year, especially for the coming summer, as I believe we are going to experience the greatest amount of building activity since 1921, 1922 and 1923. These men should have experience both in supervising and as foremen having charge of installations, as well as practical men who are expert craftsmen. This type of work can be handled only by persons having such qualifications.

DIVISION OF PUBLIC HEALTH NURSING

RUTH E. PHILLIPS, *R.N., B.S., Director*

FOREWORD

Although the Division of Public Health Nursing is a separate and distinct unit of the State Division of Public Health, it would be impossible to describe it as such. Its activities are dependent upon and completely integrated with the services of the other divisions. The program in maternity and infancy receives direction and inspiration from the Division of Maternal and Child Health; the program in communicable disease control from the Division of Epidemiology; the program in tuberculosis nursing from the Division of Tuberculosis Control; and so on with each of the other divisions. Nearly every phase of these programs must be translated into action by the individual and the family if the objectives are to be realized. The public health nurse is the worker who motivates the individual to take action.

HOW PUBLIC HEALTH NURSING IS DISTRIBUTED IN THE STATE

In 1936 when the State Division of Public Health Nursing was organized, there were forty-two full-time public health nurses working in Colorado outside of Denver. On December 31, 1939, there were ninety-four. Thirty-six were engaged in specialized programs as follows:

Venereal disease control	1
School	34
Tuberculosis	1

The remaining fifty-eight carried generalized nursing programs. This latter number includes the Colorado Springs Visiting Nurse Association, the Pueblo Child Welfare and Public Health Association, the Pueblo, Boulder and Colorado Springs Health Departments, and the county nurses. The distribution of full-time nurses doing all types of public health work in Colorado at the advent of Social Security and at the end of 1938 is shown on the maps. (See maps for 1935 and 1938 at end of section.) The distribution according to population is also shown and the school services are included although the area thus served by them is usually the local school district rather than the entire county as pictured.

In a generalized service one nurse is concerned with all health needs of the families in her district. She is the field worker who complements the efforts of physician, health officer and clinician. A minimum of one nurse to 2,500 people is needed for a complete health service in a rural section. Such a ratio does not permit an extensive bedside nursing program but does allow for a reasonable amount of morbidity care to teach the procedure to some responsible member of the family. Assistance to physicians during deliveries in the homes may be supplied in such a ratio.

If all of the ninety-four public health nurses (exclusive of Denver) were available to carry out any of the necessary phases of the public health program, the state needs would be served more adequately. As it is, 30 per cent of the area and 20 per cent of the population had no full-time nursing service at the end of 1939. Fifteen counties now lacking full-time service have requested the establishment of nursing; however, funds have not been available for this growing need.

A number of the nursing programs are supported entirely by local funds, particularly by the schools, the city health department and Visiting Nurse Associations. Six counties provide nursing services which are completely financed by county appropriations. By the end of 1939, thirty-five county nursing budgets were made up of local funds supplemented by state funds. Forty counties, including Denver, have countywide services. In most instances local funds are supplied entirely from tax sources, such as county, school and city; in others voluntary agencies, such as the Tuberculosis Association and the American Red Cross, have supplemented or entirely provided the local budget.

ANALYZING THE NEEDS

The Division of Public Health Nursing was confronted with very definite problems resulting from rapid expansion during the previous two years. Should the emphasis be placed on further expansion to include new areas or on an attempt to improve those already set up? It was decided that the latter plan should be followed. There were several reasons for this decision. The conviction grew that results in nursing depend on a service with quality as well as in quantity. Many of the nurses working in the field had not had experience in public health and needed considerable guidance from the Central Nursing Office. When the division employed only two advisory nurses, it was impossible to give the fifty nurses in the field adequate assistance. In many instances nurses were attempting to serve areas too large and populous; consequently, they were not able to give good service to the individual patient. In such situations the community was not satisfied; and the nurse did not get personal gratification from her work. In practically every area where nurses were working, it was necessary to secure local interest and cooperation. Experience shows that communities will only assume the financial responsibility of a health service when the people are well informed and interested in the health needs of the community, and the work being done.

THE PLANS FOR STRENGTHENING THE WORK OF THE NURSE IN THE FIELD

A. *Extended Academic Preparation*

When Social Security funds first became available for health work in Colorado, very few qualified nurses could be secured. Therefore, nurses with good hospital background but with only a short course in public health nursing were employed. Many of these nurses took leaves of absence to continue study during 1938 and 1939. They received some financial assistance from Social Security Funds but each nurse also financed a part of her training. During the biennium such assistance was given to nineteen nurses who were already employed in the State and to fifteen other qualified applicants. These trainees were sent to various university schools where standard public health nursing courses were offered. Among these were: Columbia University of New York; University of Washington, Seattle; Simmons College, Boston; University of California, Los Angeles; University of California, Berkeley; University of Oregon, Portland; University of Pennsylvania, Philadelphia; and University of Minnesota, Minneapolis. Worthy of special mention is an affiliation between the Denver Visiting Nurse Association and the University of Washington and the University of Oregon. The Denver Agency is accredited as a practice field for Public Health Nursing students who are working for a certificate from these universities. During 1938 and 1939, sixteen students did field work in the Denver Visiting Nurse Association before being placed in rural nursing positions. The Division of Public Health is benefited by affiliation with this private agency whose standards merit national recognition. Field practice in a Colorado Agency orients the student to our laws and resources and enables her to adjust herself to local conditions and practices.

A plan for exchanging a rural nurse for an urban nurse was initiated. This plan was approved because in Colorado there are very few urban agencies where nurses might secure the benefit of well-organized staff experience. Federal funds for public health training have diminished and nurses in rural areas have left the State to secure city work that offered broader experience. Henry Street Visiting Nurse Service of New York City, one of the outstanding public health nursing agencies in the United States, has accepted a nurse from the Division of Public Health Nursing for a year's work and in return has sent a well-trained, experienced nurse for duty in our Maternity Demonstration Center at Fort Lupton. The contribution of a nurse who has worked in an agency of known standards has already been apparent, but it is too early to report final outcomes.

B. *Added Nursing Advisory Service*

The United States Public Health Service and the Children's Bureau, United States Department of Labor, make available consultant nursing service in Colorado through their field nurses.

From a rich background of experience, these consultants bring to Colorado nurses up-to-the-minute ideas on every phase of public health nursing. They plan to be in the State at the time when nurses are meeting. In this way every public health nurse in Colorado has the privilege of learning from these advisers.

To meet the need for continuous advisory service to the nurses in the field, several advisers were added to the staff. We have had requests for advisory service from most of the nurses not working under the auspices of the Division of Public Health Nursing, and who, with one exception, have no nursing supervision. Our own advisory staff has been too small to meet these requests, but we consider such requests vital keys to a strengthening and broadening of public health work. Counties that are independently financing health service should have a larger claim to State advisory service than those under our auspices. Field advisory service insures a wise distribution of work based on knowledge of conditions, well-trained personnel, suitable records, and provides a channel through which information may flow inward from the various communities and outward from the State headquarters.

Completion of the Manual of Nursing Procedures including units for Advisory Councils, Orthopedic Nursing, School Health and Sanitation, and a School Health Project, was a part of the advisory staff work. The two latter publications were joint projects with the State Department of Education. The State Division of Public Health Nursing supplements the manuals by a periodic bulletin which brings to the field staff current information and instruction on policy changes, new developments in other Public Health Divisions or in relation to other agencies, record changes, schedules and assignments for staff study meetings. Favorable comments and requests for these publications have come to us from many States.

C. *The Continuation Study Program*

The nurse working alone needs occasional association with other nurses or she is likely to lose enthusiasm for her work. The staff study program has helped to provide this association. The nurses met in small groups and studied the need of and nursing procedures involved in health programs to promote better nutrition, orthopedic care, school nursing, infant and prenatal care, care of pneumonia cases, and the control of venereal diseases.

D. *Educational Meetings*

Nurses are encouraged to attend and participate in state and national meetings which are concerned with health, education, and welfare. Interested community people accompany them and together they find the inspiration and information which is helpful for improving local programs.

E. *Community Participation*

One of the obvious needs in any program is the participation of the people of the community; they must not only be informed about health matters but must assist in seeing that the program goes forward from year to year. The rural nurses have spent a great deal of time in organizing and developing county health councils. These councils are made up of interested representatives of organized groups in the counties, i. e., commissioners, farm groups, service clubs, parent-teacher associations, etc. At the end of the biennium all but two counties had either a well-organized council or an advisory committee which could later serve as the nucleus of such a council.

In October 1938, rural nurses were encouraged to bring lay representatives to the meeting of The Colorado Public Health Association for the purpose of organizing the Colorado Advisory Council of the State Division of Public Health Nursing. Practically every county service was represented. Officers were selected and a program outlined.

Early in 1939, after due deliberation, the Colorado Advisory Council and the Lay section of the Public Health Section of The Colorado State Nurses' Association amalgamated to form the Auxiliary of the Public Health Section of The Colorado State Nurses' Association. It serves a dual function of adviser to the Division of Public Health Nursing and Auxiliary to all public health nurses in Colorado. It is furthering and safeguarding the public health movement by a comprehensive program.

A Manual for Nursing Advisory Councils was compiled during the year and a copy was provided each county nurse and the president of the local advisory council. The councils have been particularly active in some of the counties in carrying on general health education. In others, council members have worked toward an increased budget so that more adequate service could ensue. Others have sponsored such special projects as loan funds for correction of physical defects, dental health programs, immunization campaigns, prenatal and infant clinics, and the like. Assistance at clinics and in transportation of patients has been a real contribution. A study of proposed health legislation and appropriate action on measures unfavorable to health also characterized lay effort.

What the Nurses in the Field Accomplished in 1938-1939

The field activities during the past two years have been comprehensive and varied. In each area the program was worked out to meet the needs of the community. In some districts the emphasis was placed on school work, in others on maternity and infancy programs. In every instance the goal has been a completely generalized program with the family as the center of all health activities.

Nurses have participated in newly developed programs in Colorado for the control of cancer, syphilis, tuberculosis, diphtheria, smallpox, and typhoid. Maternal and child care are promoted through instruction and service. The work of nurses is measured according to the number of patients who return at the intervals specified for medical examination; by the promptness and effectiveness by which medical orders are carried out; by the number of children immunized and by other specific standards in relation to each phase of service. No exhaustive appraisal has been possible but simple studies have been conducted. For instance, the number of visits to active tuberculosis cases has been compared to the standards; and the number of visits to the home during the confinement period is related to the total number of home deliveries in the area in order to apportion the service in relation to the total need.

Likewise when the State Division of Health was invited to establish a full-time City-County Health Department in El Paso County, an appraisal of the nursing already offered in the area was made to determine how to co-ordinate the existing and contemplated services. Miss Anna Heisler, Regional Public Health Nursing Consultant, United States Public Health Service, was loaned to make this study. As a result of this survey ten nurses from four agencies are carrying all of the nursing in their respective districts with nursing and medical supervision.

The detailed tabulation of the number of visits made in each type of health service under State auspices follows at the end of this report. It should be noted that every visit represents "a service of sufficient value to have the facts recorded on the case record of the family or patient." Even so, statistical reports show only the part of community health service which lends itself to such tabulation. The contribution of professional and volunteer workers gives vitality to public health but cannot be shown fully in statistical reports. However, these figures point to a definite improvement in the service being given. For instance, an increase in the number of expectant mothers cared for by the nurses indicates advances, as does an increase of nurse assistance to physicians at deliveries; of attendance at well-baby conferences; of attendance at classes; of crippled children brought under supervision; of preschool children protected from diphtheria and of attendance at venereal disease clinics. Likewise, the number of tuberculin tests and chest x-rays has increased markedly with many more counties conducting tuberculosis case-finding surveys. Increases are partly due to the larger number of nurses and to more comprehensive services incident to their duration. Some of the services showing particularly marked increases are shown in Graph at end of section.

LOOKING TOWARD THE FUTURE

In surveying the services and accomplishments of the Division of Public Health Nursing certain outstanding needs and problems are evident.

1. There are counties where extra nurses must be added in order to permit more adequate work with families. One nurse to 2,500 people is the ratio for complete health service in rural areas. In fourteen counties there is a ratio of one nurse to 10,000 or more people scattered over large areas. There are twenty-four counties representing 20% of the State's population that have no full-time

nursing service. There is great need for public health work in these areas and plans for their inclusion must be considered. Most of these counties have indicated a desire for nursing service but lack of funds for workers accounts for our lack of effort to develop them. An increase of the State appropriation for health purposes is necessary to extend services to all.

2. There is need for a more uniform and simplified system of record keeping. During the coming year the nurses plan to work with the department heads on this problem.

3. Plans are being laid for a better co-ordinated study program for all of the rural nurses.

4. Many requests for advisory service to nurses under local auspices have not been fulfilled because of an inadequate number of advisers; therefore, consideration of these requests is warranted.

5. More active participation on the part of local communities is needed. Our State and Local Advisory Groups assist in many ways. The primary aim of the Division of Public Health Nursing during the coming year will be to create on the part of the public an understanding of a health service such as is provided by well staffed district health units.

The public health nurses are indebted to all who have contributed to the development of public health nursing in Colorado. From national sources, from many states, as well as from our homes and schools helpful counsel and assistance have come in generous measure.

COUNTY	DATE	TYPE OF SERVICE AND CHANGE
Adams	April, 1939	One nurse (General) additional
Alamosa	April, 1939	One nurse (General) additional
Arapahoe	February, 1939	One nurse (General) additional
Crowley	January, 1938	One nurse (General) resumed
*El Paso	December, 1938	One nurse (Venereal Disease) new
Fremont	March, 1939	One nurse (General) discontinued
Jefferson	September, 1938	One nurse (General) additional
Lake	February, 1938	One nurse (General) new
**Las Animas	September, 1938	Two nurses School to General (including Delivery Service)
Las Animas	June, 1939	One nurse County School to General
Otero	March, 1938	County Auspices
Otero	July, 1938	Two nurses Delivery Service Initiated, Add'l.
Otero	March, 1939	One nurse General and Delivery Service Add'l.
Prowers	June, 1939	One nurse School to General Lamar Community
Pueblo	February, 1938	One nurse (General) new
Pueblo	March, 1938	One nurse (Venereal Disease) new
Rio Grande	October, 1938	One nurse resumed
Rio Grande	October, 1939	One nurse discontinued
Weld	(April, 1939 (	Three nurses (General including Delivery Service initiated)
Fort Lupton	(	One nurse and clinic clerk
Greeley	1939	One nurse and clinic clerk

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*In the El Paso City-County Health Department nurses employed as follows were brought together in a completely generalized service (including delivery service in Colorado Springs.)

5 V.N.A., 3 City School and Health Department, 1 County, 1 Venereal Disease, and 1 Clinic Nurse.

**One school nurse was replaced by two additional nurses carrying generalized service, also delivery service. In Trinidad area one county school nurse was replaced by a nurse carrying generalized service.

CENTRAL AND DISTRICT OFFICE

AREA	DATE	TYPE SERVICE INITIATED
Maternity Home and Hospital Adviser	December, 1938	State-wide Service
Orthopedic	July, 1938	State
Orthopedic	March, 1939	Pueblo District
Venereal Disease	December, 1938	Special District
Generalized Unit	June, 1938	Otero County District
Generalized	February, 1939	Special District
Generalized Unit	March, 1939	Weld County District
Generalized Unit	July, 1939	El Paso County District

PUBLIC HEALTH ACTIVITIES**

	1938	1939
A. COMMUNICABLE DISEASE CONTROL		
1. Admissions to service	1,404	1,715
2. Consultations with physicians	258	311
3. **Field Visits to Cases and Contacts:**		
a. Diphtheria	424	618
b. Typhoid fever and paratyphoid fever	428	188
c. Scarlet fever	432	896
d. Smallpox	230	185
e. Measles	416	552
f. Whooping cough	374	324
g. Other Cultures, mumps, chickenpox, etc.	2,650	2,080
4. **Admissions to Hospitals:**		
a. Diphtheria	19	2
b. Typhoid fever and paratyphoid fever	18	19
c. Scarlet fever	5	11
d. Smallpox	0	2
e. Other Polio., pneumonia, measles, etc.	56	45
5. **Immunizations (persons immunized):**		
a. Smallpox	9,985	18,117
b. Diphtheria, under 1 year	337	393
c. Diphtheria, 1 through 4 years	1,626	2,658
d. Diphtheria, 5 years and over	8,429	12,139
e. Typhoid fever	1,393	5,831
f. Other (1) Schick Tests	1,413	2,449
(2) Visits in behalf of patients	1,250	*1,800
6. Public lectures and talks	121	161
7. Attendance	4,672	1,957
B. VENEREAL DISEASE CONTROL		
1. Admissions to medical service	499	985
2. Cases transferred to private physicians	220	247
3. Clinic visits	5,820	19,563
4. Field Visits (includes office visits)	1,367	4,589
5. Other (Specify) Wassermann tests	985	3,117
6. Public lectures and talks	119	65
7. Attendance	2,174	1,520
C. TUBERCULOSIS CONTROL		
1. Individuals admitted to medical service	181	1,105
2. Individuals admitted to nursing service	773	1,589
3. Physical examinations in clinics	2,008	1,512
4. X-ray examinations	2,418	2,369
5. Clinic visits	7,888	4,239
6. Visits to private physicians	268	308
7. Field nursing visits	2,978	5,382
8. Office nursing visits	410	844
9. Admissions to sanitoria	57	59
10. Other service (specify) Tuberculin tests	8,082	2,972
11. Public lectures and talks	312	101
12. Attendance	6,274	5,372
D. MATERNITY SERVICE		
1. Cases admitted to antepartum medical service	508	655
2. Cases admitted to antepartum nursing service	1,524	2,112
3. Visits by antepartum cases to medical conferences	1,521	2,074
4. Visits by antepartum cases to private physicians	806	572
5. Field nursing visits to antepartum cases	3,523	4,482
6. Office nursing visits by antepartum cases	471	965
7. Cases attended by nurses for delivery service	369	600
8. Cases given postpartum medical examinations	275	329
9. Cases given postpartum examinations by private physicians	513	109
10. Cases admitted to postpartum nursing service	1,276	1,947
11. Nursing visits to postpartum cases	4,244	6,233
12. Other service. Visits in behalf of patients	1,196	*611

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*Up to June 30, 1939; thereafter, included in Field Visits.

**Limited to items reportable to U. S. Public Health Service.

	1938	1939
D. MATERNITY SERVICE—Continued		
13. Midwives registered for formal instruction	44	9
14. Midwife meetings	26	5
15. Attendance at meetings	232	3
16. Visits for midwife supervision	6	4
17. Other service. Home visits by health officers, survey maternity homes, etc.	27	145
18. Public lectures and talks	59	19
19. Attendance	553	267
20. Enrollment in maternity classes	462	700
21. Attendance	2,225	1,881
E. INFANT AND PRESCHOOL HYGIENE		
Infants:		
1. Individuals admitted to medical service	330	432
2. Individuals admitted to nursing service	1,832	2,865
3. Visits to medical conferences	711	1,571
4. Visits to private physicians	469	236
5. Field nursing visits	7,175	9,537
6. Office nursing visits	689	927
7. Other visits to nursing conferences	1,848	716
8. **Preschool:**		
a. Individuals admitted to medical service	498	828
b. Individuals admitted to nursing service	1,780	2,565
c. Visits to medical conferences	966	2,066
d. Visits to private physicians	363	222
e. Field nursing visits	2,574	4,414
f. Office nursing visits	480	167
g. Inspections by dentists or dental hygienists	0	43
h. Prophylaxis by dentists or dental hygienists	0	39
i. (1) Other service; (2) (Visits to nursing conferences)	808	827
j. Public lectures and talks	137	39
k. Attendance	2,331	561
l. Enrollment in infant and preschool classes	334	132
m. Attendance	1,062	486
F. SCHOOL HYGIENE		
1. Inspections by physicians or nurses	43,642	44,731
2. Examinations by physicians	2,837	2,770
3. Examinations by physicians with parents present	587	641
4. Individuals admitted to nursing service	3,669	4,928
5. Field nursing visits	6,249	8,201
6. Office nursing visits	2,323	3,424
7. Inspections by dentists or dental hygienists	4,319	2,270
8. Prophylaxis by dentists or dental hygienists	0	145
9. Other services	0	0
10. Public lectures and talks	235	284
11. Attendance	7,359	4,990
12. Classroom health talks	2,564	1,486
13. Attendance	34,059	27,446
G. ADULT HYGIENE		
Medical examinations:		
1. Milk-handlers	10	0
2. Other food-handlers	74	10
3. Midwives	0	0
4. Teachers	22	9
5. Others	184	23
H. MORBIDITY SERVICE		
1. Admissions to medical service	1,203	1,800
2. Admissions to nursing service	1,528	2,558
3. Clinic visits	1,104	2,993
4. Field medical visits	0	37
5. Field nursing visits	4,602	8,356
6. Office nursing visits	913	2,691
7. Admissions to hospitals	165	811
*8. Total patient days of hospital service	0	511
*9. Individuals admitted to dental service	0	186
10. Refractions	824	730
11. Tonsil and adenoid operations	1,261	713
12. Other service	0	0
I. CRIPPLED CHILDREN SERVICE		
1. Individuals reported	283	283
2. Individuals examined at diagnostic clinics	436	816
3. Individuals treated	85	233
4. Individuals admitted to nursing service	582	1,280
*5. Visits to diagnostic clinics		430
6. Nursing visits	2,866	6,622
7. Other service	0	0
8. Public lectures and talks	37	68
9. Attendance	458	2,293

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*Since July, 1939; not previously coded.

J. GENERAL SANITATION	1938	1939
1. Approved individual water supplies installed	20	2
2. New privies installed	158	54
3. New septic tanks installed	120	9
4. Private premises	679	1,573
5. Camp sites	4	21
6. Swimming pools	8	11
7. Barber shops and beauty parlors	1	1
8. Schools	573	652
9. Public water supplies	75	272
10. Sewage plants	10	46
11. Other Class meetings held	26	8
12. Buildings mosquito proofed	0	3
13. Minor drainage, linear feet completed	0	0
14. Anopheles breeding places eliminated	0	0
15. Anopheles breeding places controlled	0	2
16. Other services, fumigations, etc.	81	73
17. Public lectures and talks	28	15
18. Attendance	588	319

*K. PROTECTION OF FOOD AND MILK	1938	1939
1. Food-handling establishments registered for supervision	0	
2. Field visits to food-handling establishments	217	
3. Dairy farms registered for supervision	0	
4. Field visits to dairy farms	17	
5. Milk plants registered for supervision	0	
6. Field visits to milk establishments	19	
7. Cows tuberculin tested	0	
8. Animals slaughtered under inspection	0	
9. Carcasses condenmed in whole or in part	0	
10. Other services	0	
11. Public lectures and talks	0	
12. Attendance	0	

L. LABORATORY	1938	1939
Specimens examined:		
1. Water—bacteriological	25	231
2. Water—chemical	0	3
3. Milk or milk products	0	895
4. Other food	0	0
5. Typhoid; blood culture	0	8
6. Typhoid: Widal	10	12
7. Typhoid: stool cultures	54	30
8. Typhoid: urine cultures	0	0
9. Diphtheria cultures	230	538
10. Syphilis	220	365
11. Undulant fever (human)	2	34
12. Bangs disease (animal)	0	94
13. Typhus fever	0	0
14. Tularemia	1	3
15. Malaria	0	1
16. Gonorrhea	76	129
17. Tuberculosis	11	130
18. Feces for parasites	2	33
19. Urinalysis	174	1,206
20. Rabies	0	0
21. Other service, spotted fever, pneumonia typing, etc		1,175

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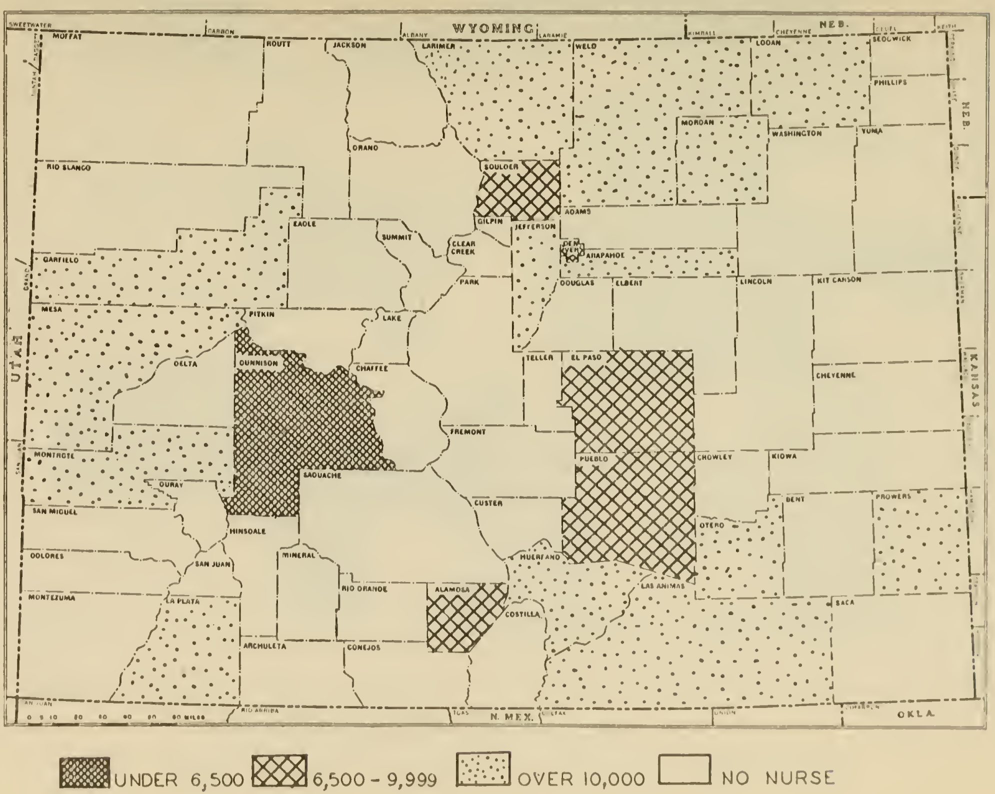
*Reporting discontinued.

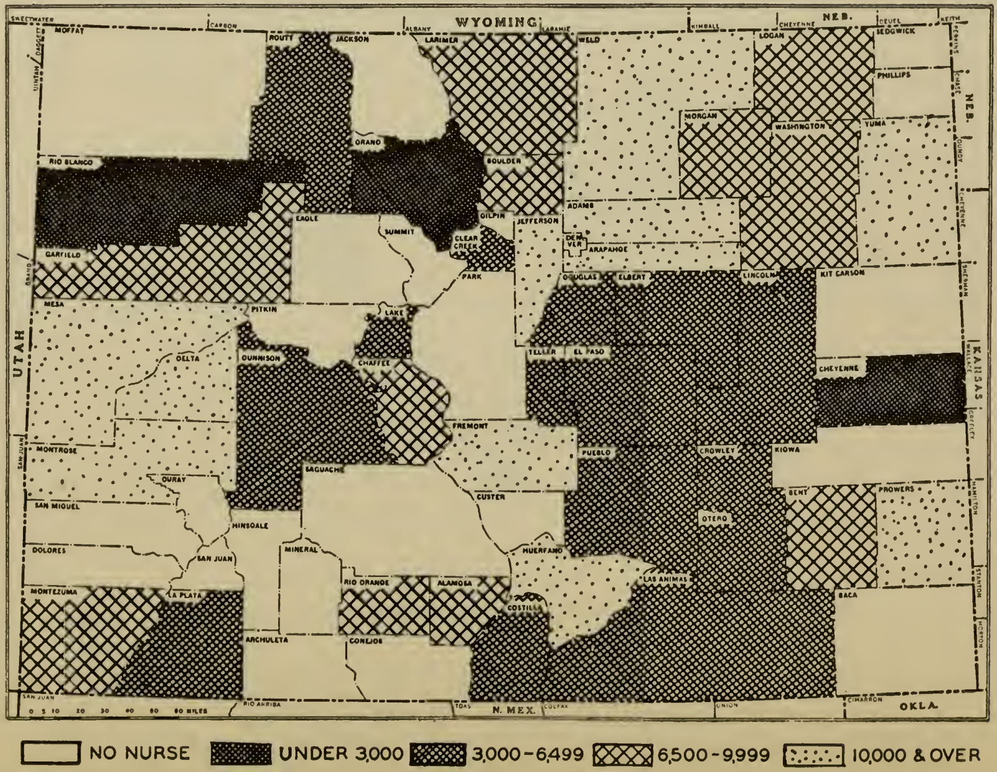
Form 1427: Approved by State and Territorial Health Officers, U. S. Public Health Service—U. S. Children's Bureau.

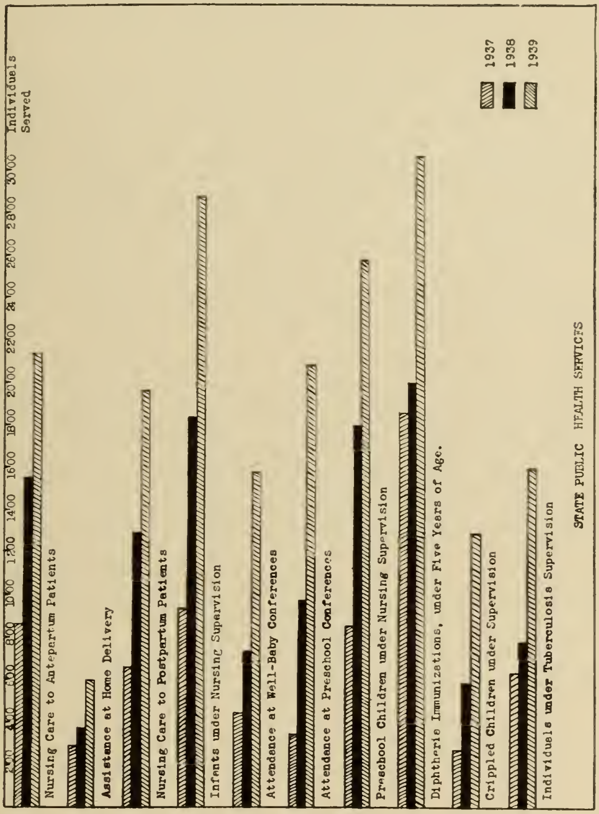
FULL TIME PUBLIC HEALTH NURSING SERVICES
EXCLUSIVE OF DENVER
POPULATION PER PUBLIC HEALTH NURSE-COLORADO, 1935



FULL TIME PUBLIC HEALTH NURSING SERVICES
EXCLUSIVE OF DENVER

POPULATION PER PUBLIC HEALTH NURSE—COLORADO 1938





STATE PUBLIC HEALTH SERVICES

DIVISION OF RURAL HEALTH WORK AND EPIDEMIOLOGY

JAMES S. CULLYFORD, M.D., C.P.H., *Director*

COUNTY HEALTH UNITS

The local department of public health constitutes the most important defense against the ravages of preventable disease, since it is through the local health unit that measures for the control of disease are brought directly to the people. The responsibility for such services rests directly upon the local government with, of course, aid and direction from the State Health Department.

For carrying on adequate local health activities, a full-time health unit consisting of at least a well trained health officer, a sanitarian, one or more public health nurses, and a clerk stenographer are necessary. The health officer or director of such a unit commands the health forces against the attacks of all forms of communicable disease; the sanitarian furnished the artillery, and the clerk-stenographer is the radio operator, while the nursing personnel is comparable to the infantry. It is the nurses who do the ''mopping up'' and hold the ground gained in this war against preventable disease and sickness.

Colorado, exclusive of Denver, now has three functioning full-time health units. The first of the present departments was established in Otero County in 1937, the second in Weld County in June, 1938, and the third in El Paso County in July, 1939. This is a beginning, but provides only some 20% of our population with health protection from disease. The desirability of such units is becoming increasingly appreciated throughout the State and it is hoped that eventually all our people will be provided with public health services. Denver County began such a unit in December, 1939, and several other counties are inquiring about the feasability of acquiring a local full-time health unit.

The present full-time county health department in Otero County started operation on February 1, 1938, with a staff consisting of a well trained health officer, two nurses, and a clerk. On July 1, 1938, the allocation of additional funds from the Federal Government, under Title V of the Social Security Act, enabled the department to add three nurses, a sanitarian and another clerk to its staff. In 1939, the personnel was again increased by the addition of a supervisory nurse and a laboratory technician.

The Weld County Health Department began operation on a full-time basis on June 15, 1938, with offices in Greeley. The personnel consisted of one trained health officer, three public health nurses and a clerk-stenographer. A sanitarian was added on July 11, 1938. In 1939 the personnel was increased by the addition of a laboratory technician. During this year a maternity demonstration unit composed of one nursing supervisor and four nurses was started in Fort Lupton.

The El Paso full-time County Health Unit was organized in 1939, for the purpose of increasing the public health facilities of the entire county and providing for unification of all county public health functions under the direction and supervision of one well trained public health officer. The personnel of this unit was composed of one full time health officer, ane supervisory nurse, one Venereal Disease nurse, one sanitarian and a clerk. This small staff is supplemented by close union with the City Health Department of Colorado Springs and other county health agencies.

The general activities of these full-time Public Health Units may be summarized as follows:

1. They investigate communicable diseases, including Tuberculosis and Venereal Diseases, and institute precautions designed to prevent the spread of these diseases.

2. They investigate and supervise general sanitary conditions, especially as they relate to the safety of water supplies and the disposal of sewage.

3. They inspect and supervise the production and purity of the milk supply.

4. They supervise the quality and safety of food and meat for public consumption, and the health of workers in food establishments.

5. They aid in the examination of school children for the discovery of communicable diseases and physical defects, notify the school authorities of their findings, and urge that the family physician be consulted for treatment of the conditions found to require correction.

6. They maintain health conferences for infants and young children.

7. They conduct clinics for the early diagnosis of Tuberculosis.

8. They conduct clinics for the diagnosis and treatment of Venereal Diseases for those who are not able to pay for such services.

9. They promote preventative measures against diphtheria, smallpox and typhoid fever.

10. They maintain a public health nursing service, which participates in many services in clinics, in schools, in health education; and makes instructive home visits in certain cases, thus assisting the family in carrying out the physician's orders or the regulations of the health department in order to prevent spread of communicable diseases throughout the community.

11. They provide laboratory service for the assistance of any physician, in the diagnosis of communicable diseases.

12. They act as a part of the vital statistics collec-

tion system, and keep an orderly record of births and deaths.

13. They provide the physicians of the community with free smallpox vaccine, diphtheria and typhoid immunization agents, diphtheria and tetanus antitoxin, and drugs for the treatment of venereal diseases.

14. They conduct, continually, a program of public health education.

15. They investigate complaints and eliminate nuisances having to do with the health of the community.

16. They carry out many other miscellaneous activities related to public health, in order that the general health of the community may attain the highest level possible.

NOTE

Anyone interested in detailed information regarding the organization of, or the volume of work done, by any of these County Public Health Units is referred to the annual reports published by each of the Units.

REPORTABLE DISEASES

In 1938 and 1939 there has been a continual increase in the number of cases of communicable diseases reported in Colorado. This increase has not been limited to any marked increase in any one disease but has been general, there being an increase in practically every reportable disease. This increase can not be interpreted as an increase in the actual number of cases of disease present in the state because the number of deaths from these diseases showed a decrease. Therefore, the increase in reported cases probably indicates merely better reporting. The Division of Epidemiology is greatly pleased with this improvement in reporting and wishes to express its appreciation to the physicians of the state.

During the biennium Colorado has been remarkably free from serious communicable disease and has had no epidemics of consequence. However, inspection of the reported cases of communicable disease show several places where the health of Colorado citizens may be improved with profit to the state and pride to the physicians. One of the black spots on Colorado's disease record is smallpox. In 1938 and 1939 there were 287 and 270 cases of smallpox respectively in these two years. For a disease which is entirely preventable this is a bad record and well shows the need for more extensive smallpox immunization programs in this state. To aid in this needed undertaking the Colorado Department of Public Health will furnish free vaccination points to any Colorado physician who requests them. Although the type of smallpox which is now present in the state is extremely mild and rarely results in death, no chances should be taken with a disease which tomorrow may revert from the mild to the virulent type. Our motto should therefore be "VACCINATE."

Another preventable disease which is still entirely too prevalent in Colorado is diphtheria. In 1938 there were 674 cases of diphtheria reported and in 1939 there were 528 cases. For the same years there were 38 and 29 deaths respectively from this disease. This large number of deaths and cases of diphtheria is of course regrettable, particularly since this gives Colorado an incidence rate greatly in excess of the large populous states of the East where the chances of infection are of course greatly increased over those in this state. This poor showing in Colorado of course indicates the need for more extensive diphtheria immunization programs. Active immunization programs must be continued every year. The number of children under six years of age immunized each year should equal or exceed the total number of births in the community. Where such a program is carried out consistently, the community need have no fear of the occurrence of diphtheria in epidemic form.

Another disease which still causes too much disability and death in Colorado is typhoid fever. Typhoid fever and its associate, paratyphoid, are of course two filth diseases which can be eliminated by modern sanitary measures. The prevalence of these diseases in Colorado indicates the need for continued efforts toward the goal of having every community supplied with proper sanitary water and sewage systems and with pasteurized milk.

The reporting of tuberculosis has increased along with that of other diseases. The increase has now reached a point where the number of cases reported has exceeded the number of deaths. This corresponds with the other states in the Union where accurate reporting of disease is known to obtain. This improvement in reporting places Colorado in a much better light as compared with former conditions when we apparently had many more deaths from tuberculosis than we had cases.

Complete statistics for the years 1938 and 1939 from both the Division of Epidemiology and the Division of Vital Statistics are being issued in a separate folder which may be obtained by applying to the Colorado State Division of Public Health, 424 State Office Building, Denver, Colorado.

PNEUMONIA CONTROL PROGRAM

On November 23, 1938, the Colorado State Division of Public Health, working in cooperation with the Pneumonia Committee of the Colorado State Medical Society, devised a plan for more effective control of pneumonia through the use of improved accepted methods of diagnosis and treatment.

In the beginning, plans were worked out on a cooperative basis by the State Division of Public Health and the Denver General Hospital for the establishment of a pneumonia ward. The

U. S. Public Health Service made funds available to the State of Colorado for this program. Serum was furnished for Types I, II, V, VII, and VIII. The program was gradually expanded to include the furnishing of serum for the treatment of pneumonia to all full-time county health departments in the state.

With the advent of sulfapyridine, it was decided to make this drug available for the treatment of pneumonia. This service was started in May, 1939, when our program for pneumonia control was re-organized as follows:

1. Typing, serum and sulfapyridine distributing stations were organized throughout the state. These are known as "typing stations."

2. A supply of sulfapyridine adequate for the treatment of a patient is issued by the typing station to any physician who reports to the station that he has a patient who is unable to pay for the drug. Routinely forty 7½ grain tablets are issued to the physician. Additional amounts may be obtained if needed.

   a. In each case, it is recommended that a sputum specimen be obtained as soon as the diagnosis of pneumonia is made, and that such specimen be typed as soon as possible. In all cases, sulfapyridine will be issued before the result of the typing has been determined. The advantages of early examination and typing of the sputum are:

      (1) This procedure allows for the tentative division of pneumonias into those of pneumococcus and non-pneumococcus etiology,

      (2) Where the pneumococcus is present, the type can be determined,

      (3) If a case does not respond to sulfapyridine in forty-eight hours, the type will be known and serum for Types I, II, V, VII or VIII can be promptly obtained from the typing station. If typing has not been performed, serious delay will be encountered in attempting to shift to serum treatment.

3. A supply of serum for Types I, II, V, VII and VIII is available at typing stations for any physician who reports to the station that he has a patient who is unable to pay for serum.

4. Typing of sputum is done by typing stations free of charge for indigent patients.

5. From personal experience and from the reports of other centers, the members of the Pneumonia Committee advise against the use of the drug without adequate clinical and laboratory control.

6. Since the present year's program must be evaluated in order to determine whether it should be continued, and in order to obtain valuable information as to the use of sulfapyridine and serum, the physicians are requested to report the results on all treated cases. We urge that the results of all cases be reported to the Colorado State Board of Health. Typing stations are supplied with postal cards for this purpose and will issue a card to each physician when he receives sulfapyridine or serum.

7. It will be noted that general experience indicates that when sulfapyridine does not produce a definitely beneficial effect in forty-eight hours, it will prove ineffective on further administration. Therefore, in such rare cases, it is suggested that a shift to serum be made.

Typing Stations and Supplies

The supplies that are available for the physician whose patient cannot afford them are as follows.: Sulfapyridine, sputum containers, card for reporting cases, and serum for pneumococcus Types I, II, V, VII and VIII, both in the usual liquid form and in the dehydrated form (Lyovac serum of Sharpe & Dohme) which this committee considers reliable. These supplies can be obtained from the following typing stations:

Mt. San Rafael Hospital, Trinidad, Colorado;
Otero County Health Unit, La Junta, Colorado;
City-County Health Unit of El Paso County, Colorado Springs, Colorado;
Community Hospital, Boulder, Colorado;
Longmont Hospital, Longmont, Colorado;
Larimer County Hospital, Fort Collins, Colorado;
Weld County Health Unit, Greeley, Colorado;
St. Mary's Hospital, Grand Junction, Colorado;
St. Vincent's Hospital, Leadville, Colorado;
Community Hospital, Alamosa, Colorado;
St. Benedict's Hospital, Sterling, Colorado;
Lamme Hospital, Walsenburg, Colorado;
Mercy Hospital, Durango, Colorado;
City Health Department, Pueblo, Colorado.

This list of typing stations will be added to from time to time as additional funds become available. When new typing stations are inaugurated in any community, the physicians of that area will be notified.

PNEUMONIA SERUM, SULFAPYRIDINE AND TYPING SERUM DISTRIBUTED BY THE COLORADO STATE DIVISION OF PUBLIC HEALTH THROUGH PNEUMONIA TYPING STATIONS FOR THE PERIOD BEGINNING DECEMBER, 1938, THROUGH DECEMBER, 1939.

Size of Vial	Type and Number of Vials Distributed					
	I	II	III	V	VII	VIII
50,000 units	92	152	8	46	54	54
20,000 units	1					
10,000 units	1					

6,200,000 units combination Types V-VII
143 1cc vials typing sera
2 complete typing kits to Colorado Springs
1 complete typing kit to Otero County
1 complete typing kit to Weld County
Sulfapyridine 39,000 tablets

PNEUMONIA PROGRAM RESULTS 1939

Total Pneumonia Cases	200
Deaths	65
Case fatality rate	29.5%
Serum treated cases	61
Deaths	12
Case fatality rate	19.6%
Sulfapyridine treated cases	106
Deaths	21
Case fatality rate	19.8%
Sulfapyridine and Serum treated cases	22
Deaths	3
Case fatality rate	13.6%
Untreated cases	75
Deaths	35
Case fatality rate	46.6%
No. of cases of results unknown	10

VENEREAL DISEASE CONTROL

A state program for the control of venereal disease was started in 1938. This program was inaugurated by the Colorado State Division of Public Health in conjunction with the Syphilis Committee of the Colorado State Medical Society. The general objectives of the program are as follows:

1. Education.
   - a. Education of the public concerning the nature of syphilis and gonorrhea, the manner of their spread, their communicability, their treatment and their control. Particular stress is laid upon teaching the public to suspect infection and to seek adequate treatment from reliable sources, instead of relying upon the dangerous practice of self-medication and drug store treatment.
   - b. Education of patients regarding their disease in order that the individual will seek sufficient treatment to cure his disease and will at the same time take precautions to prevent spread of his infection to his associates.
   - c. Cooperation with the physicians of the state in order that standard and recognized methods of treatment will be administered in all parts of Colorado.
   - d. Education of the nurse, social worker, and other public health workers—especially those who are to assume responsibility for the administration of this program.
2. Services.
   - a. Laboratory: Serological examinations for the detection of syphilis, and the examination of smears for gonorrhea.
   - b. Drugs: The distribution of standard arsenicals (neoarsphenamine and mepharsen) and a standard bismuth (bismuth subsalicylate in oil) for the treatment of syphilis. These preparations are distributed free regardless of the financial status of the patient.
3. Case finding and case control.
   - a. The establishment of clinics for diagnosis and treatment of venereal diseases in the larger cities and where full time county departments of public health are in operation.

During 1938 clinics for diagnosis and treatment were established in Denver, Pueblo and Colorado Springs; and plans are almost complete for the beginning of such clinics in Otero and Weld Counties.

The general personnel of these clinics consists of at least the following:

1. One part-time physician director,
2. One full time public health nurse for follow-up and case-finding work,
3. One full time clerk.

The number of clinic sessions held is variable, depending upon local conditions and the case-load.

I. The only clinic in operation throughout the entire year was the Pueblo Public Health Clinic. This clinic was established on January 10, 1938, by the Colorado State Division of Public Health in the city of Pueblo. The clinic personnel consists of the following:

1. One part-time physician director,
2. One full time public health nurse for follow-up and case-finding work,
3. One full time clerk.

Clinic sessions are held each morning with the exception of Sundays. Also two night clinic sessions are conducted. Suitable clinic quarters have been provided in the City Administration Building by the city of Pueblo. All equipment, record forms, office supplies and equipment, drugs, personnel salaries and travel are paid out of State funds. This clinic is designed to serve both the city and county of Pueblo, as well as referred cases from surrounding counties.

II. The Colorado Springs Public Health Clinic was established December 8, 1938, by the Colorado State Division of Public Health. The clinic personnel consists of the following:

1. One part-time physician director,
2. One full time public health nurse for follow-up and case-finding work,
3. One full time clerk.

Clinic sessions are held four times a week, which includes one night clinic session. Suitable clinic space has been provided by the county in the El Paso County Court House, in conjunction with the county physician's office.

Plans are under way for the organization on or about July 1, 1939, of a full time city and county health unit, at which time the venereal disease clinic will be incorporated as a part of the general public health program under the direct supervision of a full time health officer. All equipment and salaries of personnel are paid out of State funds.

III. The venereal disease clinic at Colorado General Hospital was established December 8, 1938, on a cooperative basis between the Colorado State Division of Public Health and the University of Colorado School of Medicine. The clinic personnel consists of the following:

1. Two part-time physicians,
2. One full time medical social worker for follow-up and case-finding work,
3. One full time clerk.

Clinics are held four times a week, which includes one night clinic session. Suitable quarters have been furnished in the outpatient department of the Colorado General Hospital. A clinic nurse is furnished by the Hospital to assist physicians in administering treatments. The clinic is designed to act as a teaching center for both medical students and practicing physicians. Plans are being considered to conduct regular post-graduate courses which are designed especially for practicing physicians who will be invited to attend these sessions. Equipment, supplies and salaries of personnel are paid out of funds furnished by the Colorado Division of Public Health.

During the year 1939 there was further expansion of venereal disease control activities in Colorado. Treatment facilities were continued at the Colorado General Hospital and in the cities of Pueblo and Colorado Springs. On March 15, 1939, the gonorrhea clinic was discontinued at Colorado General Hospital; since that time the clinic has confined its work to the treatment of syphilis. All gonorrhea cases were to be referred to the Denver General Hospital Clinic for treatment. It was found impractical to continue to treat gonorrhea cases at the Colorado General Hospital because of the low case load and because there was no indication that this case load could be increased to the point which would justify continuance of the gonorrhea clinic.

Two new venereal disease clinics were inaugurated during 1939. The Otero County Public Health Clinic was established on February 6, 1939, as a part of the general public health program in the Otero County Health Unit. Clinic sessions are held once each week in Rocky Ford and once each week in La Junta. These clinics are held in quarters provided by the county in which maternity, well-baby and other county clinics are conducted. The clinics are staffed by members of the Otero County Medical Society. Follow-up of cases is carried on by the County Health Unit public health nurses as a part of the generalized nursing program.

The Weld County Public Health Clinic was established on May 25, 1939, as a part of the generalized public health program in the Weld County Health Unit. Clinic sessions are held three times a week, which includes one night session. These clinics are held in quarters provided by the county in which maternity, well-baby and other county clinics are conducted. Two physicians have been designated by the County Medical Society to conduct the clinic. Follow-up of cases is carried on by the county public health nurses as a part of the generalized public health nursing program.

An experimental plan for the control of venereal disease in small towns and rural areas was devised and placed in operation in Prowers and Baca Counties during 1939. Since it was not feasible to organize clinics in these two rural counties, the plans were devised to pay private physicians on a fee basis. Fees were agreed upon by the local County Medical Societies. Follow-up of delinquent cases and contacts is carried on by the Prowers County public health nurse. In Baca County, where no public health nurse was available, temporary arrangements were made to have follow-up of cases carried on by a worker in the local Welfare Department until the services of a county public health nurse could be provided.

Further advances were made in the control of venereal disease during 1939 through legislative acts which provided for the amendment of Sections 5 and 10, Chapter 107, 1935 Colorado Statutes Annotated, relating to marriage, providing for examinations and serological tests of applicants for a marriage license, and effectual duration of license; also an act requiring prenatal serological blood tests, providing for its administration, and prescribing penalties for violation thereof.

The Colorado State Board of Health was entrusted with the administration of these two legislative provisions and immediately steps were taken by the Colorado State Board of Health to administer this educational program. These legislative provisions were not only of an educational value to the public, but provided the State Board of Health with a more widespread program for finding infectious cases of syphilis and other venereal diseases and thus aiding these cases in receiving treatment so as to prevent the further spread of these diseases.

COLORADO GENERAL HOSPITAL VENEREAL DISEASE CLINIC REPORT

(1938 figures include only December)

1. New cases (never previously admitted) positive diagnosis:

	Syphilis		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939
Male	9	98	6	14	....	2
Female	10	152	6	6	....	....
Totals	19	250	12	20	....	2

2. Number of cases carried over from the former Colorado General Hospital Clinic, including cases under treatment during December, 1938:

	Syphilis	Gonorrhea	Chancroid
Male	110	3	....
Female	134	1	....
Totals	244	4	....

3. Number of treatments:

	Syphilis							
	Arsphenamine		Mercury, Bismuth, etc.		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939	1938	1939
Male	50	1,257	159	3,303	5	82	....	4
Female	77	1,295	174	4,002	1	6	....	....
Totals	127	2,552	333	7,305	6	88	....	4

4. Number of laboratory tests:

	Totals		Syphilis, Serologic Tests		Gonorrhea Smears	
	1938	1939	1938	1939	1938	1939
Positive	8	447	8	437	....	10
Negative	15	265	12	255	....	10
Totals	23	712	20	692	....	20

5. Total number of visits to clinic for treatment, examination or advice:

1938	477
1939	9,654

6. Number of social service visits:

To Contacts		To Delinquents	
1938	1939	1938	1939
4	187	9	354

DENVER GENERAL HOSPITAL VENEREAL DISEASE CLINIC REPORT

1. New cases (never previously admitted) positive diagnosis:

	Syphilis		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939
Male	479	288	357	226	8	15
Female	489	265	291	202	....	2
Totals	968	553	648	428	8	17

2. Number of treatments:

	Syphilis							
	Arsphenamine		Mercury, Bismuth, etc.		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939	1938	1939
Male	....	5,130	19,849	13,941	3,060	3,093	6	21
Female	....	5,293	19,629	12,065	4,460	4,462	....	2
Totals	....	10,423	39,478	26,546	7,520	7,555	6	23

3. Number of laboratory tests:

	Totals		Syphilis, Serologic Tests		Gonorrhea Smears	
	1938	1939	1938	1939	1938	1939
Positive	2,893	3,171	1,275	1,509	1,618	1,662
Negative	2,597	3,974	1,382	1,731	1,215	2,243
Totals	5,490	7,145	2,657	3,240	2,833	3,905

4. Total number of visits to clinic for treatment, examination or advice:

1938	45,753
1939	44,077

5. Number of social service visits:

To Contacts		To Delinquents	
1938	1939	1938	1939
124	278	3,684	3,576

EL PASO COUNTY PUBLIC HEALTH CLINIC REPORT

(1938 figures include only December)

1. New cases (never previously admitted) positive diagnosis:

	Syphilis		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939
Male	1	46	2	22	....	1
Female	2	46	....	7	....	....
Totals	3	92	2	29	....	1

2. Number of old cases carried over from the former county clinic, including cases under treatment during December, 1938:

	Syphilis	Gonorrhea	Chancroid
Male	26	13	....
Female	31	7	....
Totals	57	20	....

3. Number of treatments:

	Syphilis							
	Arsphenamine		Mercury, Bismuth, etc.		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939	1938	1939
Male	30	926	34	796	34	205	....	1
Female	31	924	18	915	17	60	....	....
Totals	61	1,850	52	1,711	51	265	....	1

4. Number of laboratory tests:

	Totals		Syphilis, Serologic Tests		Gonorrhea Smears	
	1938	1939	1938	1939	1938	1939
Positive	16	223	14	193	2	30
Negative	22	675	13	630	9	45
Totals	38	898	27	823	11	75

5. Total number of visits to clinic for treatment, examination or advice:

1938	217
1939	4,878

6. Number of social service visits:

To Contacts		To Delinquents	
1938	1939	1938	1939
....	96	....	195

PUEBLO PUBLIC HEALTH CLINIC REPORT

1. New cases (never previously admitted) positive diagnosis:

	Syphilis		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939
Male	105	42	86	50	2	....
Female	109	52	29	12	....	....
Totals	214	94	115	62	2	....

2. Number of treatments:

	Syphilis							
	Arsphenamine		Mercury, Bismuth, etc.		Gonorrhea		Chancroid	
	1938	1939	1938	1939	1938	1939	1938	1939
Male	621	745	1,252	1,992	1,217	679	5	....
Female	664	970	1,228	1,917	228	143	....	....
Totals	1,285	1,715	2,480	3,909	1,445	822	5	....

3. Number of laboratory tests:

	Totals		Syphilis, Serologic Tests		Gonorrhea Smears	
	1938	1939	1938	1939	1938	1939
Positive	188	165	132	122	56	43
Negative	316	339	248	295	68	44
Totals	504	504	380	417	124	87

4. Total number of visits to clinic for treatment, examination or advice:

1938	5,675
1939	7,156

5. Number of social service visits:

To Contacts		To Delinquents	
1938	1939	1938	1939
95	24	343	454

OTERO COUNTY PUBLIC HEALTH CLINICS—1939

1. New cases (never previously admitted) positive diagnosis:

	Syphilis	Gonorrhea	Chancroid
Male	24	4	....
Female	32	7	....
Totals	56	11	....

2. Number of treatments:

	Syphilis			
	Arsphenamine	Mercury, Bismuth, etc.	Gonorrhea	Chancroid
Male	277	227	7	....
Female	315	202	58	....
Totals	592	429	65	....

3. Number of laboratory tests:

		Syphilis Serologic Tests	Gonorrhea Smears
Positive	54	35	19
Negative	254	234	20
Totals	308	269	39

4. Total number of visits to clinic for treatment, examination or advice: 928.

	To Contacts	To Delinquents
5. Number of social service visits	101	81

WELD COUNTY PUBLIC HEALTH CLINIC—1939

1. New cases (never previously admitted) positive diagnosis:

	Syphilis	Gonorrhea	Chancroid
Male	20	8	....
Female	20	6	....
Totals	40	14	....

2. Number of treatments:

	Syphilis			
	Arsphenamine	Mercury, Bismuth, etc.	Gonorrhea	Chancroid
Male	212	141	....	....
Female	213	144	....	....
Totals	425	285	....	....

3. Number of laboratory tests:

		Syphilis Serologic Tests	Gonorrhea Smears
Positive	17	12	5
Negative	54	51	3
Totals	71	63	8

4. Total number of visits to clinic for treatment, examination or advice: 585.

	To Contacts	To Delinquents
5. Number of social service visits	....	....

DRUGS DISTRIBUTED BY THE COLORADO STATE DIVISION OF PUBLIC HEALTH DURING THE BIENNIUM

	1938	1939
Neoarsphenamine:		
0.3	3,072 amps.	2,911 amps.
0.45	8,554 amps.	6,219 amps.
0.6	11,239 amps.	8,602 amps.
Sulpharsphenamine:		
.1	430 amps.	230 amps.
.2	1,141 amps.	1,096 amps.
.3	440 amps.	450 amps.
.4	110 amps.	230 amps.
Tryparsamide:		
.1	255 amps.	252 amps.
.3	688 amps.	310 amps.
Mapharsen:		
.04	3,500 amps.	4,335 amps.
.06	4,750 amps.	3,990 amps.
Bismarsen:		
.1	180 amps.	....
Bismuth:		
30 cc. jars	2 jars	114 jars
60 cc. jars	1,106 jars	588 jars
500 cc. jars	54 jars	101 jars
Acetarsone:		
(100 tablets 0.05 gm.)	61 bottles	30 bottles
Sulfanilamide:		
(5 gr. tablets)	67,770 tablets	422,000 tablets

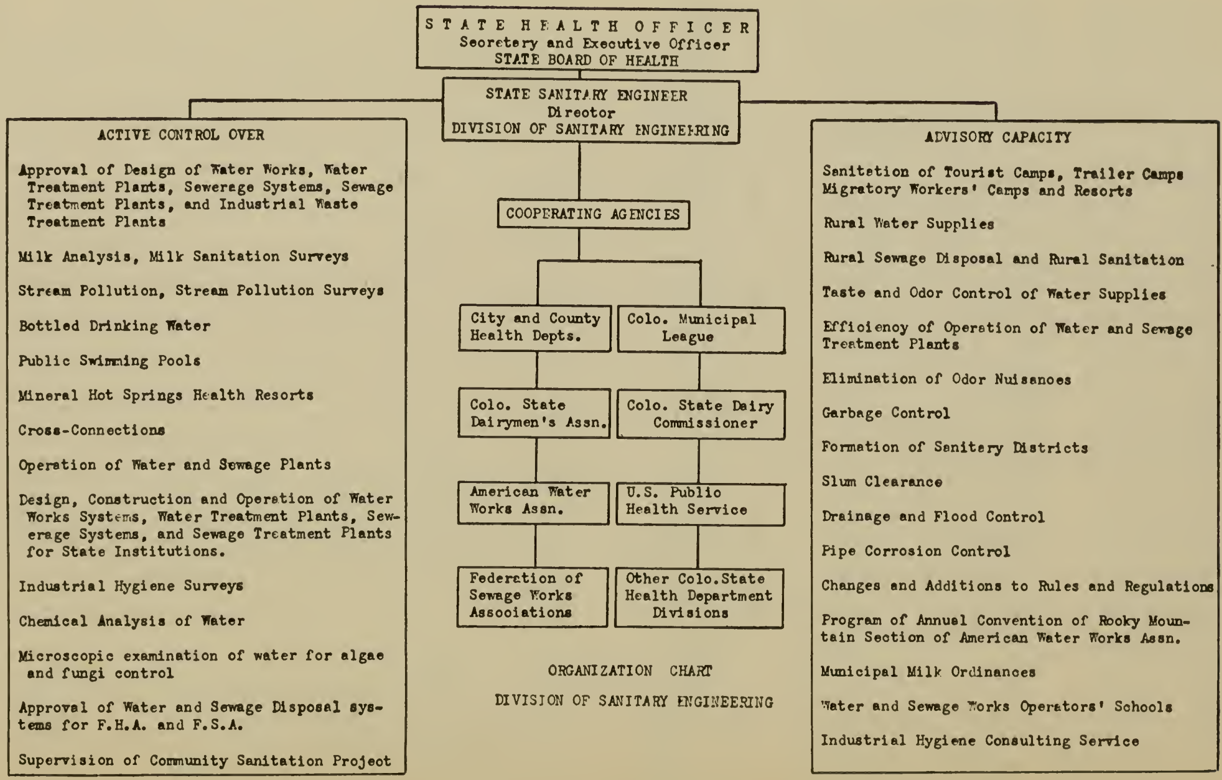
CANCER CONTROL

The Cancer Control Program of the Colorado State Division of Public Health has been concentrated on lay education. It is the belief of the department that the patient should possess sufficient knowledge to suspect his condition and present himself to his physician for diagnosis. If the patient is unable to do this, little can be accomplished despite the most complete facilities for cancer treatment.

The educational program has been conducted by the combined efforts of the Department of Health, the Colorado State Medical Society, and the Colorado Women's Field Army of the American Society for the Control of Cancer. A large number of the people of the state have been reached by means of lectures, exhibits, radio talks, newspaper articles and the distribution of pamphlets. By the efforts of the Women's Field Army, 54 of the 63 counties of the state have been organized and are now carrying on local cancer educational programs.

COMMUNICABLE DISEASE STATISTICS

The statistical reports of the Division of Rural Health and Epidemiology are published in a separate supplement which is available upon request.


STATE HEALTH OFFICER
Secretary and Executive Officer
STATE BOARD OF HEALTH
STATE SANITARY ENGINEER
Director
DIVISION OF SANITARY ENGINEERING
ACTIVE CONTROL OVER
Approval of Design of Water Works, Water Treatment Plants, Sewerage Systems, Sewage Treatment Plants, and Industrial Waste Treatment Plants
Milk Analysis, Milk Sanitation Surveys
Stream Pollution, Stream Pollution Surveys
Bottled Drinking Water
Public Swimming Pools
Mineral Hot Springs Health Resorts
Cross-Connections
Operation of Water and Sewage Plants
Design, Construction and Operation of Water Works Systems, Water Treatment Plants, Sewerage Systems, and Sewage Treatment Plants for State Institutions.
Industrial Hygiene Surveys
Chemical Analysis of Water
Microscopic examination of water for algae and fungi control
Approval of Water and Sewage Disposal systems for F.H.A. and F.S.A.
Supervision of Community Sanitation Project
COOPERATING AGENCIES
City and County Health Depts.
Colo. Municipal League
Colo. State Dairymen's Assn.
Colo. State Dairy Commissioner
American Water Works Assn.
U.S. Public Health Service
Federation of Sewage Works Associations
Other Colo. State Health Department Divisions
ADVISORY CAPACITY
Sanitation of Tourist Camps, Trailer Camps Migratory Workers' Camps and Resorts
Rural Water Supplies
Rural Sewage Disposal and Rural Sanitation
Taste and Odor Control of Water Supplies
Efficiency of Operation of Water and Sewage Treatment Plants
Elimination of Odor Nuisances
Garbage Control
Formation of Sanitary Districts
Slum Clearance
Drainage and Flood Control
Pipe Corrosion Control
Changes and Additions to Rules and Regulations
Program of Annual Convention of Rocky Mountain Section of American Water Works Assn.
Municipal Milk Ordinances
Water and Sewage Works Operators' Schools
Industrial Hygiene Consulting Service

ORGANIZATION CHART

DIVISION OF SANITARY ENGINEERING

DIVISION OF SANITARY ENGINEERING

B. V. HOWE, B.S., *Director*

The activities of this Division have been devoted primarily to the administrative work required under Chapter 145, Colorado Session Laws, 1925, and under the Rules and Regulations of the State Board of Health.

The major functions through which the Division contributes to the enhancement of public health in Colorado are outlined in the attached Organization Chart.

WATER SUPPLIES

Water works improvements for the two years consisted of new filter plants, water mains, new sources of supply, reservoirs, and sterilization equipment for forty-four municipalities. The approximate cost of these improvements for the two years was $7,359,130.00. Table I shows the distribution of expenditures.

Due to the lack of personnel, we have been unable to supervise or control the water supplies, sewerage systems, and general sanitation of all Tourists' Camps, except in two counties where sanitarians are located.

It is very desirous to license water superintendents and plant operators, in order to raise the standards of this personnel. When this is done, a school for water and sewage plant operators will be given by this Division, one week each winter. Lectures and laboratory work will be very beneficial to these men and more cooperation will be received from them.

Adequate and trained personnel in the Engineering Division, both State and local, will lead naturally and rapidly to the better training and appointment of qualified local water works operators and superintendents who, in turn, will assist in bringing about the improvements and safeguards in the maintenance and operation of water supplies necessary for the continuous production and delivery of water of assured safe sanitary quality.

SEWERAGE SYSTEMS AND SEWAGE DISPOSAL

Twenty-one additional municipal sewage treatment plants were constructed, or are now under construction, during the two years. Two other sewage plants added units for additional treatment of their sewage. Plans were approved for five other sewage treatment plants, the construction of which has been delayed. Complete sewerage systems were constructed for three municipalities, and sewer additions for two others. The approximate cost for this construction of sewage treatment plants and sewers amounted to $1,647,300.00. Table II shows where the construction was done. It is very encouraging to note the increase in the population served with proper sewage treatment. In 1934 an urban population of 37,000 (6.11%) was supplied with facilities for adequate sewage treatment. Since then sewage treatment facilities have been made available to an additional 467,000 individuals (77.4%). The urban population now supplied with sewage treatment has reached a total of 504,442 individuals, which is 83.6% of the total urban population of the state. The average for the United States is 52%. An attempt is being made to have a bill passed in the next state legislature requiring the rest of the municipalities to install proper sewage treatment plants within two years. Tables III and IV show the types of treatment at the municipalities.

Considerable work should be done on industrial wastes, i.e., beet sugar waste, canning factory waste, cheese factory, milk and creamery waste. Due to the lack of a chemical laboratory this work was delayed. However, a few of the beet sugar factories have been persuaded to lagoon their waste during the sugar beet campaign, thus keeping it out of the rivers.

The following table shows the water-borne diseases on the South Platte River watershed for three periods:

Period	Area	Typhoid Fever Death Rate Per 100,000 Population	Diarrhea & Enteritis Death Rate Per 100,000 Population
1929-1933	South Platte Watershed	3.1	20.4
1929-1938	South Platte Watershed	2.5	17.8
1934-1938	South Platte Watershed	2.0	15.1

It is interesting to note the decrease for the ten-year period 1929-1938, over the five-year period 1929-1933, and for the second five-year period, 1934-1938. I believe this is largely due to the fact that during the years 1935 to 1938, inclusive, fifteen municipal sewage treatment plants were constructed and put in operation on this watershed, as shown in Table V of sewage treatment plants. In January, 1940, 94.7% of the urban sewered population on this watershed were served with proper sewage treatment. The few sewage treatment plants that have been constructed on the other watersheds have not been operating a sufficient time to affect the statistics on water-borne diseases. The mortality and morbidity figures for diarrhea and enteritis apply only to those under 2 years of age.

In Tables III and IV which show the sewage treatment plants in Colorado, there are 31 which consist of primary treatment. These municipalities do not need at this time complete treatment because of the high dilution factor available in adjacent streams.

In the table which shows the complete treatment plants, you will note that they consist of 9 trickling filters, 4 chemical precipitation plants, 6 lagooning or leaching fields, and 1 magnetite filter.

Trickling filters are the most popular for secondary treatment in Colorado, and all of these plants consist of low rate standard flow design, which provides for between 2 to 3 million gallons per acre per day. The magnetite filter was considered applicable in Denver, in order to remove by filtering, bacteria, and especially the amoeba cysts, on account of the large amount of water from the South Platte River which is used just below Denver for the irrigation of vegetables. Experiments have shown that the amoeba cysts cannot be killed with the usual dosage of chlorine. The 4 chemical precipitation plants provide for flexibility in operation. Chemicals may be used during the growing periods, and thus turn out a much better effluent from these sewage plants. The 5 lagooning or leaching field plants are the best, from a stream pollution standpoint, because the sewage effluent does not enter any stream.

INDUSTRIAL HYGIENE

A state-wide Industrial Hygiene Survey was started in April, 1938. A physician, chemist, and clerk were employed full time, and part-time surveys were made by two engineers in this Division. However, the physician resigned in July, 1938, in order to practice medicine and the chemist completed the survey.

The field work consisted of surveying 526 factories and plants covering 31,130 industrial workers. This gave results of exposures to 24.5% of all gainful workers in Colorado. The field work was finished the latter part of November, and the report was finished in February, 1939. The following results show the need for industrial hygiene work in Colorado:

Total per cent workers exposed to:

Inorganic non-metallic dusts	20.4%
Metallic dusts and fumes	28.5%
Cases	28.2%, etc.

Drinking water facilities in the majority of the mines were also found to be inadequate and unsafe.

This will lay a foundation for the elimination of metal poisoning, silicosis, and other occupational diseases. It will help us to evaluate the potential health hazards associated with a wide variety of occupational diseases and will lay a basis for the constructive development of Industrial Hygiene. An Industrial Hygiene Unit will enable the State Board of Health to better aid industry in solving and controlling its industrial health problems such as dusts, fumes, vapors, lighting, ventilation, overcrowding, fatigue, etc.

An Industrial Hygiene Laboratory was established in December, 1939. At the same time equipment was added for making chemical analyses of water and bacteriological analyses of milk. Plans were then made to make detailed industrial hygiene surveys of metal mines, smelters and coal mines. Plans were also made to employ a chemist and bacteriologist to do milk and water analyses, and assist in the industrial hygiene laboratory and field work.

MILK CONTROL

Due to the numerous cases of undulant fever reported, phosphate test kits were purchased in order to test milk in the field to determine whether or not it has been properly pasteurized. Some raw milk has been sold in bottles labeled as pasteurized.

The efforts of this Division in milk control have been devoted to influencing city and town councils to improve and adopt milk ordinances, based upon the United States Public Health Service standard milk ordinance. Complete surveys of the dairies on milk sheds and of the distributing milk plants are made upon requests from city and town officials. The following table shows the progress made in milk control work:

Cities Adopting Standard U. S. Public Health Service Milk Ordinances	Cities Who Have Adopted New Milk Ordinances	Cities Planning on Adopting or Amending Milk Ordinances	
La Junta	La Junta	Montrose	Longmont
Pueblo	Pueblo	Gunnison	Idaho Springs
Julesburg	Grand Junction	Boulder	Estes Park
	Colo. Springs	Palisade	Greeley
	Denver	Delta	Glenwood Springs
	Rocky Ford	Alamosa	Salida
	El Paso County	Las Animas	Fort Collins
	Sterling	Weld County	Trinidad
		Holyoke	Wray

A state-wide milk code has been drawn up and the adoption is being considered by the State Board of Health at this time. At the present time, unfortunately, there is no law covering sanitary milk control in Colorado. The milk control work has therefore been almost entirely educational, although the need of a complete milk control program is urgent.

GENERAL FIELD WORK

Water Supply

Municipal water supplies investigated	113
Water supplies certified which are used on interstate carriers	31
Institutional supplies investigated	7
Cross connections investigated	97
Construction plans examined for water supply projects	42
F. H. A. water supply approvals	47

Sewerage and Sewage Treatment

Municipal construction plans examined and approved	28
Municipal treatment plants investigated	43
Private and institutional plants investigated	162
Sewerage systems investigated	21
F. H. A.	166

General Investigation Relating to Sanitation

Public health nuisances	371
Stream pollution	2
Public swimming pools	20
Dairies	68

OUTBREAKS

Water:

Silt—Typhoid.

Milk:

Elizabeth—Hemolytic streptococci.
Pueblo—State Hospital—Diphtheria.
Numerous cases of undulant fever have been reported.

Special Investigations

Industrial hygiene survey	State-wide
Milk surveys	7
Transient and labor camps survey	1
State reformatory sewage plant design	1
Water supply construction for F. S. A.	5 counties
Flood disaster	1
Mineral Hot Springs surveys	3
Slum clearance survey	5 counties

Chemical analysis and more research work should be done on the water from hot mineral pools. There are sixteen of these known to be serving the public as health resorts and making claims for curing most any known disease by the use of hot mineral water. Authenticity of claims by the operators for numerous health cures is very questionable.

A special survey was made to determine the bactericidal properties of these waters from mineral hot springs. A definite amount of polluted water was added to an equal amount of the mineral water to be tested. After contact periods of one minute, five minutes, and ten minutes, one ml. portions were plated on standard agar and incubated at 37 degrees F. for 48 hours. The results showed that the alleged bactericidal properties of these waters were greatly exaggerated. These analyses were made at the pools with a field incubator. Therefore, it is imperative that some type of sterilization be required for these pools. Nearly every mineral pool in the state contains sulphides, and 64 pools contain hydrogen sulphide, thus making the problem of chlorination difficult. The ordinary methods of sterilization with chlorine will be difficult because of the high chlorine demands of these sulphuretted waters. Our analyses showed that the mineral springs themselves were sterile and the bacterial count in the pools was quite low, probably because of the large volume of water flowing through them and the low bathing load.

One factor that must be considered in the death rate from water or filth-borne diseases, is the living conditions of indigents, and other low-income groups of the population. This is shown by Table VI and Chart I which gives the figures of a slum clearance survey made in 1939. The county nurses in five counties working under the jurisdiction of the State Board of Health filled out questionnaires regarding living conditions of those contacted on their regular visits.

You will notice in this table that in Costilla county, 19 per cent of the people surveyed suffered from diarrhea and enteritis during the past year. This is easily explained from the figure under ''Questionable Sewage Disposal,'' which shows that 91 per cent of these persons used insanitary privies, and 75 per cent had no screens on their homes. It is interesting to note from this table that 12 per cent of the people in Otero county suffered from diarrhea and enteritis, and that 48 per cent used ditch water for their water supply. No doubt this high percentage is due to the fact that shallow ground water in this county is extremely hard.

This condition exists in several other counties in the lower Arkansas Valley. Hence, the importance of sewage treatment, in order to eliminate the pollution and contamination of our streams from which the irrigation ditches are supplied.

In order to assist the Restaurant Division, analysis has been made, and approval or disapproval given, for all commercial hypochlorite products submitted for use in the sterilization of dishes and glassware.

A community sanitation project, supervised by this division, is in progress, which consists of the construction of sanitary, fly-tight privies on public and private property. The owners benefiting from the construction furnish the materials and receive government labor gratis from Works Progress Administration Funds. We have had approximately 250 carpenters and laborers working on this project, and 23,156 of these privies have been constructed. Chart No. 2 shows the progress in the community sanitation program.

NEEDED LEGISLATION

To appropriate funds for a complete industrial hygiene unit.

To license water superintendents and water and sewage plant operators.

To clarify the sewer rental law in order to provide collections on water bills and allow the shutting off of water when the sewer rental is unpaid.

To require municipalities who do not have proper sewage treatment to construct sewage treatment plants within two years.

To provide for statewide milk control laws and adequate funds for this work.

To provide funds for a stream pollution survey of mine waste.

In the survey report made of the Colorado state government by the Griffenhagen firm, it is recommended the public health functions of several other boards and divisions be placed in this division. This recommendation covers the Dairy Commissioner, Plumbing Division, Board of Cosmetology, Board of Barber Examiners, and the Board of Embalming Examiners. This division would then be called the Division of Sanitation and would function and consist of the same duties as the Division of Sanitation in the New York and Kentucky State Departments of Health. It is the opinion of this division that the Board of Embalming Examiners should be put in the Division of Vital Statistics because of the necessity of obtaining burial permits and other work pertaining to vital statistics. If these recommendations are followed, with the exception of the Embalming Examiners Board, the general efficiency can be increased by training all inspectors to cover the inspection work of all of the activities in these separate boards and divisions. The inspection of slaughter plants, tourist camps, resorts, barber shops, beauty parlors, drug stores, plumbing, and dairy and milk distributing stations, can be done by any and all of the inspectors and by the technical personnel after sufficient training of the inspectors is completed.

PROPOSED WORK

Corrosive Water

Plans have been made to make studies of all public water supplies to determine the proper treatment to eliminate corrosion in pipe lines. This information supplied to city engineers and water superintendents would save municipalities appreciable sums of money in the replacement of water distribution systems.

Mineral Hot Springs

Mineral springs that are used for health resorts have extremely corrosive waters and it is proposed to make experiments to determine proper coagulants to precipitate out the minerals which cause corrosion and deterioration of pipe systems.

Under the present conditions these mineral hot springs resorts are clearly in need of repairs. Studies will also be made to determine the most feasible method for sterilizing the waters for drinking and bathing purposes in these mineral hot springs resorts.

Consulting Engineering

The plans and specifications for the design of sewage treatment plants for the state penitentiary and the State Home for Mental Defectives at Grand Junction will be done by this division as soon as funds are available for construction.

Cross Connections

A complete survey of municipal water distribution systems will be made as far as possible and the removal of all cross connections required. These surveys are necessary because of the existence of numerous Hopper type frostproof toilets that are connected to public water supplies. A sketch of this type of toilet is attached which shows the cross connection in a bleeder line from the water pipe to the sewer.

Sanitary Districts

Surveys will be made of suburban districts to influence property owners to form sanitary districts which will enable them to sell bonds for the construction of water and sewage systems.

Personnel

The personnel of this division for 1938 and 1939 has been as follows: One chief engineer who is the director of the division; one industrial hygienist who is a chemist with one and one-half year's medical school training; one assistant engineer with a Master's degree in sanitary engineering; two sanitation officers; one draftsman; one community sanitation supervisor; and two stenographers.

TABLE I

WATER WORKS IMPROVEMENTS, 1938

Town	Cost	Improvement
Grand Junction	$ 300,000	New filter plant and water mains
Montrose	150,000	New filter plant and water mains
Lafayette	40,000	New filter plant and water mains
Louisville	1,000	Improvements to filter plant
La Veta	25,000	New reservoir
Denver	870,000	New filter plant
Denver	4,500,000	Water tunnel, reservoir and mains
Pueblo	10,000	Mains
Greeley	10,000	Mains
Leadville	5,000	Plant and mains
Silt	10,000	New source of supply
DeBeque	10,000	New source of supply
Longmont	50,000	New mains
Gypsum	25,000	New flow line
Boulder	15,000	New mains
La Junta	6,000	New mains
Total for 1938	$6,027,000	

WATER WORKS IMPROVEMENTS, 1939

Town	Cost	Improvement
Dillon	$ 10,000	Water works system
Erie	20,000	Rapid sand filter and appurtenances
Rifle	30,000	Rapid sand filter and appurtenances
Fruita	250	Hypochlorite feeder
La Veta	30,000	Reservoir
Lamar	15,000	New wells and pipe line
Colorado Springs	15,000	Pipe line replacements
Kremmling	5,000	New source of supply
Grand Junction	100,000	Rapid sand filter and appurtenances
Montrose	100,000	Pipe line replacements
Hayden	800	Chlorinator
Golden	25,100	Reservoir, chlorinator and pipe line
Arvada	1,400	Distribution pipe lines
Alamosa	1,650	Distribution pipe lines
Brighton	1,300	Distribution pipe lines
Boulder	3,300	Distribution pipe lines
Brush	100	Distribution pipe lines
Crook	150	Distribution pipe lines
Delta	31,100	Distribution pipe lines
Fort Logan	3,150	Distribution pipe lines
Fountain	1,000	Distribution pipe lines
Hotchkiss	600	Distribution pipe lines
La Junta	350	Distribution pipe lines

TABLE I—Continued

WATER WORKS IMPROVEMENTS, 1939

Town	Cost	Improvement
Longmont	$ 3,750	Distribution pipe lines
Louisville	2,760	Distribution pipe lines
Mancos	5,300	Distribution pipe lines
Steamboat Springs	1,140	Distribution pipe lines
Denver	933,930	Distribution pipe lines, reservoir and improvements
Total for 1939	$1,332,130	
Total for 1938	6,027,000	
Total for 1938 and 1939	$7,359,130	

TABLE II

SEWERAGE AND SEWAGE DISPOSAL IMPROVEMENTS

Town	Approximate Cost	Improvement
Pueblo	$ 500,000	Sewage treatment plant
Longmont	150,000	Sewage treatment plant
Arvada	30,000	Sewage treatment plant
Grand Junction	150,000	Sewage treatment plant and sewers
Montrose	35,000	Sewage treatment plant
Flagler	35,000	Sewage treatment plant and sewers
Rifle	17,000	Sewage treatment plant
Ridge	12,000	Sewage treatment plant
Troutdale	4,000	Sewage treatment plant
Westminster	2,000	Sewage treatment plant
Fort Morgan	40,000	Sewage treatment plant
Crook	3,000	Sewage treatment plant
Mancos	15,000	Sewage treatment plant and sewers
Animas City	15,000	Sewage treatment plant and sewers
Salida	10,000	Sewer extensions
Sterling	12,000	Sewer extensions
Brighton	10,000	Additional treatment
La Salle	10,000	Primary sewage treatment plant
Loveland	50,000	Sewage plant—complete treatment
Trinidad	10,000	Replacement of trickling filter media
Green Mountain Dam	5,000	Primary sewage treatment plant and sewers
Estes Park (Stanley Hotel)	6,000	Sewage plant—complete treatment
Estes Park	50,000	Sewage treatment plant
Estes Park (Reclamation Camp)	10,000	Sewage plant—complete treatment
Caddoa Dam	5,000	Sewage plant—complete treatment
Rural Districts (1938)	384,354	Sanitary privies—5,537
Rural Districts (1939)	276,300	Sanitary privies—4,605
Total	$1,647,300	

TABLE III

COLORADO MUNICIPALITIES HAVING COMPLETE SEWAGE TREATMENT

City	1930 Population	Construction Date	Type of Treatment
Berthoud	811	1935	Imhoff tank and trickling filters
Brighton	3,394	1937	Trickling filter and Imhoff tank
Castle Rock	478	1932	Septic tank, leaching field
Colorado Springs	33,328	1937	Chemical precipitation, sludge incineration
Denver	287,861	1937	Chemical precipitation, Magnetite filter
Denver (private slaughter house)	500	1937	Settling tank, cesspools, leaching fields
Dolores	557	1930	Septic tank, chlorination, lagooning
Eaton	1,221	1937	Slow sand filter
Estes Park	417	1921	Imhoff tank, trickling filter, chlorination
Fort Morgan	4,423	1939	Imhoff tank, lagooning
Greeley	12,203	1936	Clarification, sludge digestion and chemical precipitation
Littleton	2,019	1920	Inhoff tank, trickling filter, secondary sedimentation, sterilization
Longmont	6,029	1938	Separate sludge digestion and trickling filter
Loveland	5,506	1935	Imhoff tank, trickling filters
Pueblo	50,096	1937	Chemical precipitation
Springfield	1,393	1937	Septic tank, subsurface disposal
Sterling	7,195	1937	Trickling filter
Trinidad	11,732	1920	Imhoff tanks, trickling filters
Westminster	753	1937	Settling tank, serator, slow sand filter
Windsor	1,852	1937	Clarifier and trickling filter

TABLE IV

Colorado Municipalities Having Primary Sewage Treatment

City	1930 Population	Construction Date	Type of Treatment
Akron	1,135	1918	Septic tank
Arvada	1,276	1939	Clarifier and separate sludge digestion
Aurora	2,295	1929	Sludge digestion, Dorr clarifier
Boulder	11,223	1934	Sludge digestion, Dorr clarifier
Brush	2,312	1937	Imhoff tank
Burlington	1,280	1920	Imhoff tank
Cortez	921	1927	Septic tank
Craig	1,418	1918	Septic tank
Eads	1,123	1937	Imhoff tank
Eagle	630	1937	Doten tank
Fort Lupton	1,578	1937	Clarifier and separate sludge digestion
Glenwood Springs	1,825	1937	Clarifier and separate sludge digestion
Grand Junction	10,247	1939	Clarifier and separate sludge digestion
Haxtun	1,028	1919	Imhoff tank
Hayden	554	1937	Septic tank
Holyoke	1,226	1919	Imhoff tank
Hugo	712	1925	Doten tank
La Veta	782	1919	Imhoff tank
Leadville	3,771	1926	Septic tank
Limon	1,101	1926	Septic tank
Loveland	100	1938	Private slaughter house
Montrose	3,566	1939	Clarifier and separate sludge digestion
Oak Creek	1,211	1937	Septic tank
Ordway	1,139	1920	Septic tank
Platteville	533	1939	Septic tank
Ramah	171	1927	Septic tank
Rifle	1,287	1937	Imhoff tank
Steamboat Springs	1,198	1933	Septic tank
Wellington	553	1922	Imhoff tank and exfiltration
Wray	1,783	1919	Imhoff tank
Yuma	1,360	1919	Septic tank

TABLE V

Growth of Sewage Treatment in Colorado

TREATMENT PLANTS JANUARY 1, 1934

Primary Treatment

City	Population
Akron	1,135
Aurora	2,295
Burlington	1,280
Cortez	921
Craig	1,418
Haxtun	1,028
Holyoke	1,226
Hugo	712
La Veta	782
Leadville	3,771
Limon	1,101
Ordway	1,139
Ramah	171
Steamboat Springs	1,198
Wellington	553
Wray	1,783
Yuma	1,360
Total (17 Cities)	21,875

Complete Treatment

City	Population
Castle Rock	478
Dolores	557
Estes Park	417
Littleton	2,019
Trinidad	11,732
Total (5 Cities)	15,203

TREATMENT PLANTS SINCE JANUARY 1, 1934

Primary Treatment

City	Population
Boulder	11,223
Brush	2,312
Eads	1,123
Eagle	630
Ft. Lupton	1,578
Glenwood Springs	1,825
Hayden	554
Oak Creek	1,211
Rifle	1,287
Montrose	3,566
Grand Junction	10,247
Arvada	1,276
La Salle	564
Green Mountain Dam	1,000
Total (14 Cities)	38,396

Complete Treatment

City	Population
Berthoud	811
Brighton	3,394
Colorado Springs	33,328
Denver	287,861
Eaton	1,221
Greeley	12,203
Longmont	6,029
Loveland	5,506
Pueblo	50,096
Springfield	1,393
Sterling	7,195
Windsor	1,852
Ft. Morgan	4,423
Edgewater	1,473
Englewood	7,980
Manitou	1,205
Ridge	1,500
Stanley Hotel	300
Reclamation Camp	600
Martin Dam	500
Total (16 Cities)	428,970

Total Treatment Plants .... 53; 504,442 Population
Total Plants Required .... 56; 99,488 Population
Total 100 Per Cent Treatment....103; 603,272 Population
Per Cent Population Now Served 83.6

TABLE VI

COLORADO SLUM CLEARANCE SURVEY BY B. V. HOWE

March and April, 1939

County	Number People Surveyed	Morbidity in Past Year—In Per Cent		Questionable Sewage Disposal Per Cent	Screens Per Cent		Questionable Water Supply Per Cent	
		Typhoid	Diarrhea and Enteritis		None	Poor	Questionable	Ditch Water
Costilla	461	3	19	91	75	16	93	0
Jefferson	170	0	0	58	39	16	52	0
Otero	126	0	12	91	35	35	22	48
Routt	141	1	19	65	29	23	10	3
Yuma	201	1½	1½	97	10	61	61	13

TOURIST CAMPS AND RESORTS CLASSIFIED

CLASS "A" CERTIFICATES

Columbine Motel and Cottages
1700 South Santa Fe Drive, Denver
R. H. Robinson, Manager

Costanzo Tourist Apartments, Gunnison, Colorado
Mrs. Frank Costanzo, Manager

Costello Auto Court Hotel, Salida, Colorado
Louis Costello, Jr., Manager

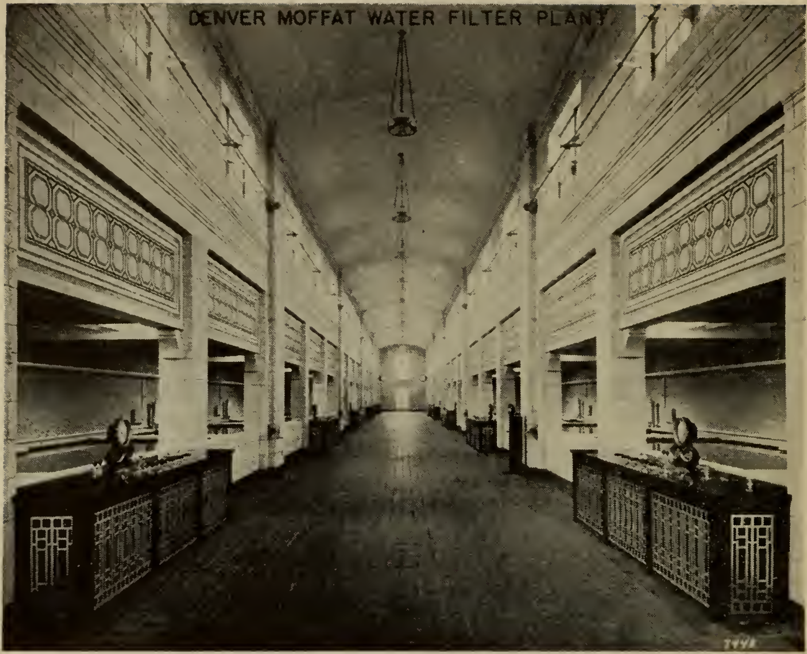
Tucker Ranch—Western Camp for Boys
Near Nederland, Colorado
C. O. Auger, Manager

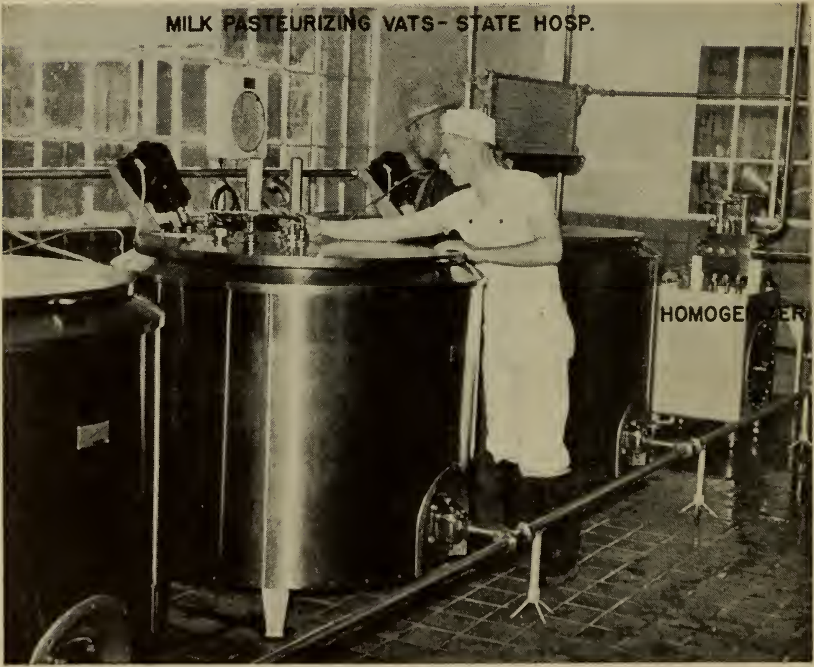
Sterling Motor Lodge, Sterling, Colorado
R. L. Coots, Owner

CLASS "B" CERTIFICATES

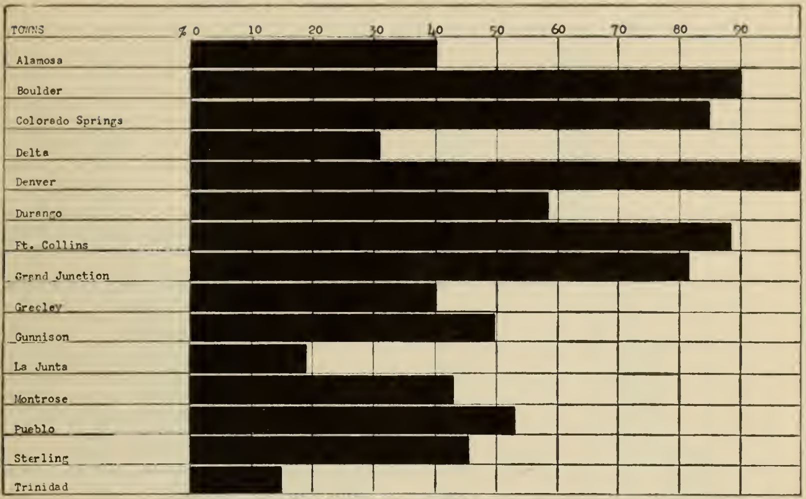
Gray's Cabins, Sterling, Colorado
C. A. Gray, Manager

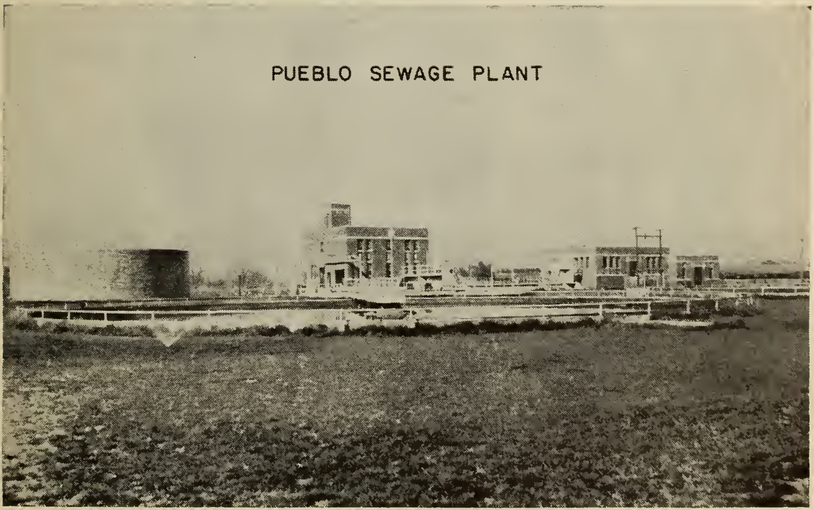
Midway Cottage Camp, Sterling, Colorado
M. Miller, Owner


DENVER MOFFAT WATER FILTER PLANT


MILK PASTEURIZING VATS- STATE HOSP.
HOMOGE ER

PERCENT PASTEURIZED MILK SOLD IN CITIES




PUEBLO SEWAGE PLANT

COLORADO STATE BOARD OF HEALTH
Division of Sanitary Engineering
COLORADO URBAN POPULATION HAVING FACILITIES FOR ADEQUATE SEWAGE TREATMENT - JAN. 1933 to JAN. 1940

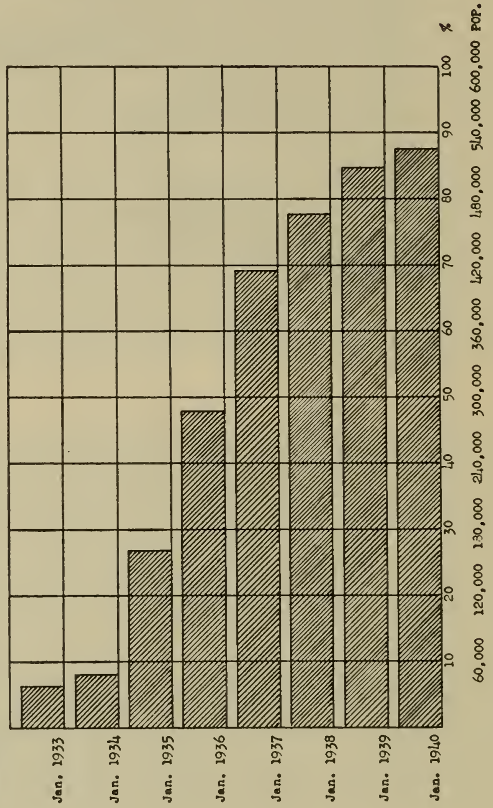
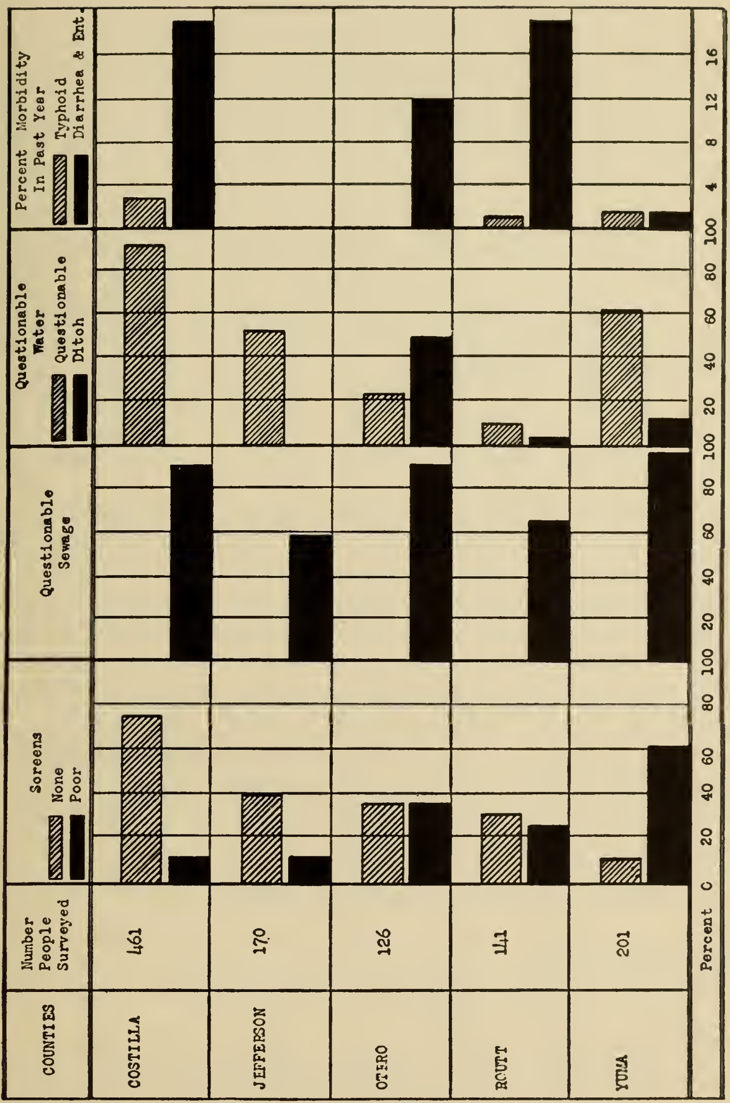


CHART 1



SLUM CLEARANCE SURVEY

DIVISION OF TUBERCULOSIS CONTROL

Alfred R. Masten, M.D., M.P.H., *Director*

The program of the Division of Tuberculosis Control is based upon the dictum that *the control of tuberculosis depends upon the proper control of the bacilli laden sputum.* "Control the sputum," says Plunkett, "and the spread of tuberculosis is prevented—neglect this measure and cases multiply." The principal procedures which have been instituted in order to prevent the dissemination of tubercle bacilli in Colorado are listed under the following seven heads:

I. Education or Information Service Regarding Tuberculosis for Physicians, Nurses, and the General Public

A. The information service for physicians consists of stressing the facts regarding tuberculosis which all physicians know. The facts particularly stressed are:

1. The importance of reporting every case of tuberculosis encountered.

2. The need for sputum examination on every patient who coughs and raises sputum.

3. The likelihood of unknown cases of tuberculosis being present in any family where there is an open case of tuberculosis or where a person has died of tuberculosis.

4. The importance of the tuberculin test and the X-ray in the detection of tuberculosis before symptoms and signs of the disease appear.

5. The necessity of sanatorium care for all persons with open tuberculosis.

6. The necessity of isolation and education for all individuals having sputum which contains tubercle bacilli.

B. The information service for nurses and the general public stresses the following well known facts:

1. That tuberculosis is a contagious disease caused by living organisms or germs called "tubercle bacilli."

2. That tuberculosis is invariably contracted from some person who has tuberculosis.

3. That the germs which cause tuberculosis are in the sputum coughed up by the sick person.

4. That a person gets tuberculosis by inhaling or swalling some of the sputum coughed up by a person who has tuberculosis.

5. That early tuberculosis can be detected only by careful medical examination, where use is made of (a) the tuberculin test, (b) an X-ray film of the chest, (c) a careful medical history, (d) a complete physical examination, (e) laboratory examination of the sputum, (f) thoughtful consideration and interpretation of the results secured by all these means.

6. That tuberculosis, when discovered in an early stage, can be cured.

7. That the best place to become cured of tuberculosis is in a sanatorium.

II. Case-Finding Clinics

Active and continuous case-finding clinics are important because early tuberculosis produces few symptoms and practically no physical signs. Furthermore, it is only the early case which can be treated successfully at a reasonable cost. Early treatment, preferably in a sanatorium, not only offers the individual an excellent chance for cure but likewise protects the whole community from infection with tubercle bacilli by isolating the source of the disease before wholesale dissemination has taken place. The groups for which clinics have been especially advocated are:

A. Suspects sent in by the family physician.

B. Contacts with a case of open tuberculosis, or with a person who died of tuberculosis.

C. All persons who have a chronic cough and who raise sputum.

D. Young adults between the ages of 15 and 30 years, particularly those in the low income groups of the population.

E. Hard rock miners.

F. High school seniors and college students—these primarily for their educational value.

The procedure followed in the clinics is as follows:

A. All apparently well persons are given a tuberculin test (first test strength. PPD is recommended). This test is omitted in obviously sick persons.

B. All positive reactors are given an X-ray examination of the chest.

C. All persons whose chest X-rays shows shadows suggestive of tuberculosis or other lung disease are given a physical examination.

D. A report of the findings and the provisional diagnosis, together with recommendations, are sent to the individual's private physician.

E. When active tuberculosis is found in an indigent patient, efforts are made to secure sanatorium care through the facilities of the State Department of Public Welfare.

The results of the case-finding clinics which were held in Colorado during 1938 and 1939 under the supervision of the Division of Tuberculosis Control in cooperation with the Colorado state and county medical societies and the Colorado Tuberculosis Association are shown in Table No. 1.

III. Segregation and Treatment of All Patients Suffering with Tuberculosis

Isolation and treatment in a sanatorium are strongly urged for all individuals with active tuberculosis. Sanatorium care for indigents is secured by cooperation with the State Department of Public Welfare, which in Colorado has charge of tuberculosis hospitalization for indigents. Isolation in the home is undertaken whenever the tuberculous individual is financially unable to pay for sanatorium care themselves or when he cannot qualify for state aid.

IV. Nursing Follow-up of All Cases of Tuberculosis and All Contacts

Public health nursing follow-up of all known contacts has been conducted in all counties in which the health department has a public health nurse. In this connection, special emphasis is placed upon the examination of contacts by means of the tuberculin test and the X-raying of all positive reactors, together with a complete medical examination of any person whose X-ray shows shadows suggestive of tuberculosis or of other diseases of the chest.

Follow-up on actual cases of tuberculosis stresses the importance of proper disposal of sputum, the necessity of maintaining proper hygienic conditions in the home, and the measures necessary to prevent spread of the disease throughout the community. As an aid in the care of the patient in the home, a special pamphlet on "Tuberculosis of the Lungs" has been prepared by the director of the Division of Tuberculosis Control for distribution to tuberculous patients.

V. Aid to Physicians

This consists of free interpretation of X-ray films of the chest whenever requested by a Colorado physician. The department also offers aid in the diagnosis of suspicious cases of tuberculosis and gives suggestions and recommendations for treatment for any particular case of tuberculosis. Laboratory examination of sputum, by both smear and culture, is supplied free.

VI. Registration File

A registration file is maintained of all patients reported as having tuberculosis and all tuberculous patients discharged from Colorado sanatoria. This file offers a means for the evaluation of the tuberculosis problem in the state and furnishes a record of removals from one part of Colorado to another, as well as removals to other states. The information recorded in this file is strictly confidential.

VII. Investigation and Research

During the biennium special studies have been carried out on several special groups as: 800 Spanish-Americans in Prowers county and all NYA enrollees in the state. At the present time a study of Colorado hard rock miners is being undertaken.

RECOMMENDATIONS

All present activities of the Division of Tuberculosis Control should be continued and all should be considerably expanded in both personnel and equipment in order that adequate control of tuberculosis in Colorado may be attained. Expansion is particularly needed for the following activities:

A. Intensification of the case-finding program in order that a larger percentage of cases can be discovered in the minimal stage. Discovery of cases in the minimal stage not only allows the patient to become cured of his disease but also prevents widespread dissemination of tuberculosis throughout the community.

B. Extension of the information service regarding the general precautions necessary to prevent infection. There are still too many people who do not know that tuberculosis is a contagious disease and so do not realize the importance of segregation of all cases of open tuberculosis by hospitalization. Hospitalization offers the best chances of cure for the individual and at the same time reduces opportunities for spread of the disease.

C. More adequate provisions for the education of the public relative to the infectious nature of tuberculosis, the measures necessary for its diagnosis and cure, and the use of available facilities for the application of present knowledge.

D. Added facilities should be provided for the acquisition of new scientific knowledge concerning tuberculosis as it exists in Colorado, particularly in relation to special racial groups, hard rock miners, etc. Likewise, studies of environmental factors and tuberculosis, climate, etc., need further elucidation.

E. Steps should be taken to promote an expanding program which will ultimately provide sheltered and supervised employment for arrested and stationary cases.

NOTE: From October 1, 1938, to August 1, 1939, Dr. A. R. Masten was on leave of absence for special training in public health. During this period, Dr. John H. Fountain held the position of acting director of the Division of Tuberculosis Control.

CASE-FINDING CLINICS IN COLORADO, 1938 AND 1939

Clinic held in County	Total Attendance	Number Tuberculin Tested	Number of Positive Reactors	Per cent of Positive Reactors	Number X-rayed	Chest Examinations	Number of Cases Reinfection type Tuberculosis Found
Adams	279	273	57	13.8	61	11	0
Arapahoe	253	119	38	32.0	17	26	0
Alamosa	116	71	24	34.0	76	19	1
Baca	5	----	--	----	5	5	0
Bent	148	59	31	52.5	120	45	6
Boulder	620	620	186	30.0	180	19	1
Chaffee	83	51	9	17.6	40	28	0
Cheyenne	228	224	40	17.9	36	18	1
Clear Creek	310	293	54	18.4	70	17	1
Conejos	7	4	3	75.0	6	6	0
Costilla	367	356	97	27.2	86	24	1
Crowley	256	131	80	61.0	102	56	6
Delta	9	9	9	100.0	9	9	2
Douglas	213	213	48	22.6	52	18	6
Elbert	386	370	41	11.0	55	24	2
Fremont	598	513	108	21.0	199	59	6
Garfield	383	302	40	13.2	109	29	3
Gilpin	136	132	27	20.2	29	5	0
Grand	110	108	14	13.0	16	12	0
Gunnison	422	420	75	18.2	72	0	0
Huerfano	725	711	187	26.2	197	57	1
Jackson	58	42	8	19.0	24	0	0
Jefferson	815	780	176	22.2	309	51	1
Kit Carson	626	626	100	16.0	100	28	0
Lake	85	82	20	23.4	23	14	1
La Plata	761	696	263	37.8	328	74	2
Larimer	579	579	119	25.8	145	36	5
Las Animas	590	496	306	61.5	366	172	21
Lincoln	341	341	70	20.4	65	14	1
Logan	96	23	23	100.0	95	44	1
Mesa	1,355	853	266	31.2	438	243	31
Montezuma	343	333	24	7.2	34	9	2
Morgan	406	405	78	19.3	79	47	0
Otero	1,107	1,027	260	25.2	344	113	11
Prowers	1,119	1,042	539	51.6	587	104	4
Rio Grande	408	236	52	22.0	224	50	2
Routt	332	332	68	20.2	88	12	2
Sedgwick	47	----	--	----	46	32	3
Teller	223	217	38	17.5	31	9	1
Weld	5,991	5,991	447	28.4	1,680	400	25
TOTALS	20,964	19,080	4,025	21.0	6,619	1,913	150

RESIDENT DEATHS AND DEATH RATES PER 100,000 POPULATION, BY AGE, FROM TUBERCULOSIS, ALL FORMS: COLORADO, 1938-1939

AGE (Years)	TOTAL						MALE				FEMALE			
	Average 1938-39		1938		1939		Average 1938-39		1938	1939	Average 1938-39		1938	1939
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Number	Number	Rate	Number	Number
Under 5	13.0	13.2	7	7.9	19	18.5	4.5	8.8	0	9	8.5	16.7	7	10
5- 9	3.5	2.8	4	3.6	3	2.7	2.5	4.4	2	3	1.0	1.8	2	0
10- 14	4.5	4.2	2	1.9	7	6.7	2.0	3.6	1	3	2.5	4.8	1	4
15- 19	21.5	21.0	21	20.8	22	21.6	7.5	14.0	7	8	14.0	27.2	14	14
20- 24	34.5	37.0	31	33.4	38	41.0	16.0	34.9	16	16	18.5	39.8	15	22
25- 29	51.0	59.0	43	52.0	59	71.0	24.0	59.4	19	29	27.0	55.0	24	30
30- 34	47.5	59.0	59	75.0	36	45.0	24.0	59.0	29	19	23.5	60.0	30	17
35- 39	62.0	80.5	70	87.0	52	72.3	34.5	99.5	41	28	26.5	59.0	29	24
40- 44	64.5		67		62		46.0		50	42	18.5		17	20
45- 49	51.0	75.0	51	72.0	51	85.0	39.5	113.0	39	40	11.5	33.2	12	11
50- 54	42.0		38		46		34.0		31	37	8.0		7	9
55- 59	43.5	96.0	44	93.0	43	99.5	37.0	114.9	36	38	6.5	37.2	8	5
60- 64	36.5		33		40		28.5		26	31	8.0		7	9
65- 69	29.5	101.0	32	104.0	27	96.0	21.0	112.6	23	19	8.5	71.5	9	8
70- 74	19.0		18		20		12.5		13	12	6.5		5	8
75- 79	12.0	102.0	10	96.0	14	107.0	6.0	118.0	6	6	6.0	69.5	4	8
80- 84	4.5		5		4		4.0		5	3	0.5		0	1
85- 89	1.5		2		1		1.5		2	1	0		0	0
90- 94	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Over 100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	1.5	0	2	0	1	0	1.5	0	2	1	0	0	0	0
All Ages	544	49.0	540	48.9	548	49.2	34.7	61.5	349	345	195	36.0	191	200

NATIVITY OF COLORADO RESIDENTS WHO DIED OF TUBERCULOSIS IN 1938 AND 1939

	1938	1939
Alabama	7	12
Arizona	1	1
Arkansas	12	7
California	1	3
Colorado	92	106
Connecticut	5	0
District of Columbia	3	1
Florida	0	1
Georgia	4	5
Idaho	0	1
Illinois	28	27
Indiana	10	15
Iowa	21	31
Kansas	19	25
Kentucky	10	10
Louisiana	5	2
Maine	1	2
Maryland	2	3
Massachusetts	2	2
Michigan	6	7
Minnesota	3	2
Mississippi	3	5
Missouri	48	39
Montana	1	0
Nebraska	8	10
New Jersey	5	8
New Mexico	33	43
New York	17	14
North Carolina	2	1
North Dakota	....	2
Ohio	11	13
Oklahoma	8	8
Pennsylvania	13	8
Rhode Island	1	0
South Dakota	2	1
Tennessee	13	8
Texas	24	11
Utah	1	4
Vermont	0	1
Virginia	5	1
Washington	0	0
West Virginia	3	4
Wisconsin	7	11
Wyoming	1	2
Mexico	15	20
Greece	1	1
Austria	12	6
Canada	5	6
Scandinavia	13	12
England, Scotland, Wales	7	1
Ireland	2	4
Germany	9	2
Italy	4	4
Poland	3	4
Russia	10	9
Unknown	10	8
Others	10	13
Total	540	548

COLORADO RESIDENT DEATHS FROM TUBERCULOSIS (ALL FORMS) BY MONTHS—1938 AND 1939

Month	1939	1938	Average
January	61	35	48
February	50	43	46.5
March	59	59	59
April	46	46	46
May	57	53	55
June	40	60	50
July	33	37	35
August	39	47	45
September	40	38	39
October	46	50	48
November	38	33	35.5
December	39	37	38

RESIDENT DEATHS FROM TUBERCULOSIS (ALL FORMS) COLORADO, BY COUNTY AND SEX, 1938 AND 1939

County	Tuberculosis Deaths Residence Allocated		Tuberculosis Deaths Male		Tuberculosis Deaths Female	
	1938	1939	1938	1939	1938	1939
Adams	13	22	12	17	1	5
Alamosa	1	2	0	1	1	1
Arapahoe	19	22	15	15	4	7
Archuleta	0	1	0	1	0	0
Baca	0	1	0	1	0	0
Bent	4	3	4	3	0	0
Boulder	12	26	9	17	3	9
Chaffee	2	2	2	2	0	0
Cheyenne	1	1	0	1	1	0
Clear Creek	3	4	3	4	0	0
Conejos	4	4	1	3	3	1
Costilla	1	3	0	2	1	1
Crowley	2	5	1	2	1	3
Custer	0	1	0	1	0	0
Delta	3	3	1	1	2	2
Denver	213	199	143	132	70	67
Dolores	0	1	0	1	0	0
Douglas	3	0	2	0	1	0
Eagle	1	1	1	0	0	1
Elbert	0	0	0	0	0	0
El Paso	55	39	32	20	23	19
Fremont	6	8	3	6	3	2
Garfield	3	3	2	1	1	2
Gilpin	1	1	1	1	0	0
Grand	0	1	0	1	0	0
Gunnison	2	3	1	3	1	0
Hinsdale	0	0	0	0	0	0
Huerfano	11	6	5	4	6	2
Jackson	0	0	0	0	0	0
Jefferson	13	14	9	9	4	5
Kiowa	0	0	0	0	0	0
Kit Carson	1	0	1	0	0	0
Lake	0	2	0	2	0	0
La Plata	4	4	3	3	1	1
Larimer	9	7	6	4	3	3
Las Animas	18	22	8	12	10	10
Lincoln	1	0	0	0	1	0
Logan	1	5	1	3	0	2
Mesa	5	15	1	6	4	9
Mineral	0	0	0	0	0	0
Moffat	1	0	1	0	0	0
Montezuma	4	4	3	2	1	2
Montrose	5	3	4	1	1	2
Morgan	8	5	5	2	3	3
Otero	18	16	7	11	11	5
Ouray	2	4	2	0	3	1
Park	1	1	1	0	1	0
Phillips	1	1	1	0	0	1
Pitkin	0	2	0	0	1	1
Prowers	2	3	0	2	2	1
Pueblo	36	33	23	19	13	14
Rio Blanco	1	0	0	0	1	0
Rio Grande	8	4	6	3	2	1
Routt	0	6	0	4	0	2
Saguache	1	22	1	0	0	2
San Juan	1	0	1	0	0	0
San Miguel	1	1	1	1	0	0
Sedgwick	0	1	0	0	0	1
Summit	0	1	0	0	0	1
Teller	4	2	4	2	0	0
Washington	1	0	0	0	1	0
Weld	16	16	10	5	6	11
Yuma	1	0	0	0	1	0
Resident Institutions	16	12	12	9	4	3
TOTALS	540	548	337	345	187	203

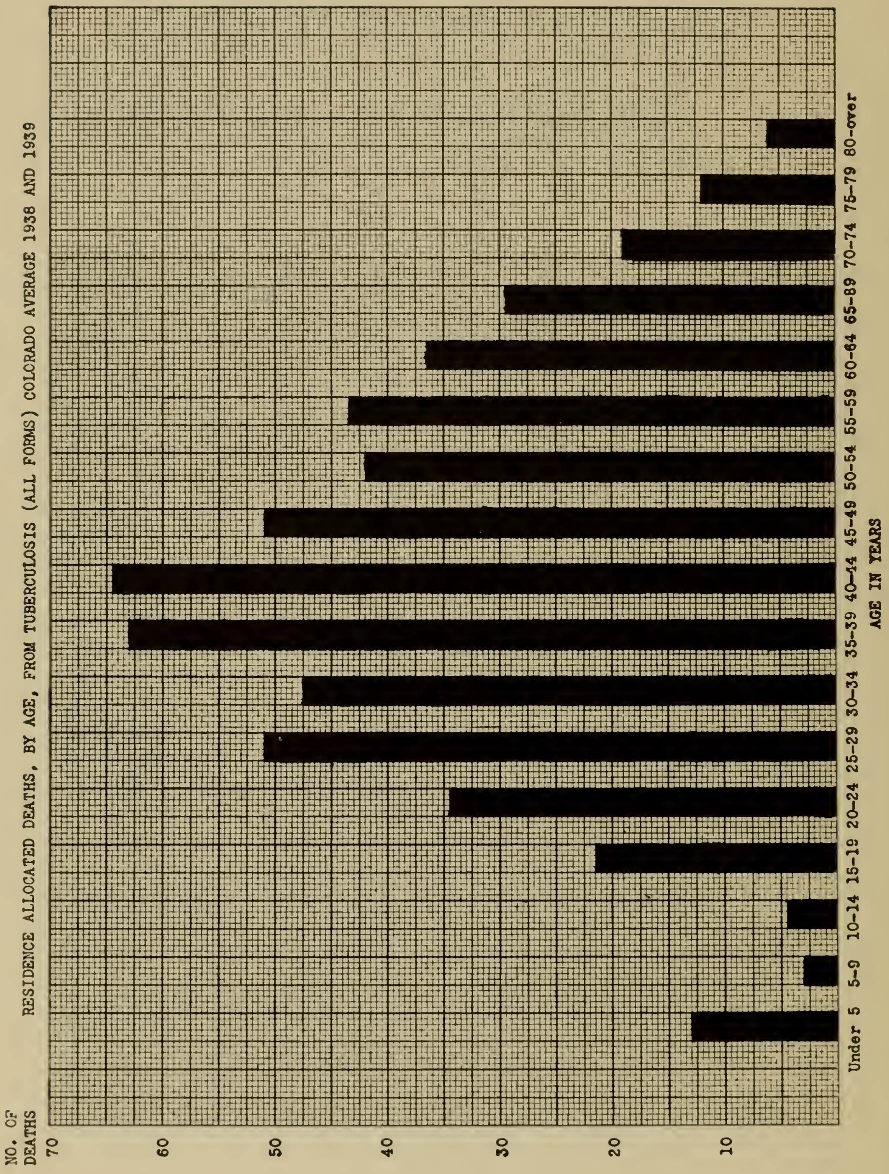
PROWERS COUNTY TUBERCULOSIS SURVEY (SPANISH-AMERICAN) MAY, 1938

Age in Years	No. Tuberculin Tested	Tuberculin Neg.	Tuberculin Pos.	Per cent Pos.	No. X-rayed	No. Chest Examination	Primary Tuberculosis			Reinfection Tuberculosis		
							Healed	Active	Undet.	Healed	Active	Undet.
Under 5	156	133	23	14.7	22	6	17	5	0	0	0	0
5- 9	144	97	47	32.6	41	5	36	5	1	0	0	0
10-14	129	61	68	52.7	66	4	65	1	0	0	0	0
15-19	90	29	61	67.7	60	4	60	0	0	0	0	0
20-24	66	15	51	77.2	51	1	51	0	0	0	0	0
25-29	46	5	41	89.1	41	3	39	0	0	1	1	0
30-34	42	3	39	92.8	39	4	37	0	0	2	0	0
35-39	35	1	34	97.1	34	2	34	0	0	0	0	0
40-44	30	1	29	96.6	29	2	30	0	0	0	0	0
45-49	27	3	24	88.8	24	0	24	0	0	0	0	0
50-54	27	0	27	100.0	24	0	24	0	0	0	0	0
55-59	19	0	19	100.0	19	3	18	0	0	0	0	1
60-64	7	1	6	85.7	6	2	4	0	0	1	1	0
65-69	3	0	3	100.0	3	2	2	0	0	1	0	0
70-74	1	0	1	100.0	1	0	1	0	0	0	0	0
75-79	1	0	1	100.0	1	0	1	0	0	0	0	0
80-84	1	0	1	100.0	1	0	1	0	0	0	0	0
Unknown	9	5	4	44.4	1	0	1	0	0	0	0	0
TOTAL	833	354	479	57.5	463	38	445	11	1	5	2	1

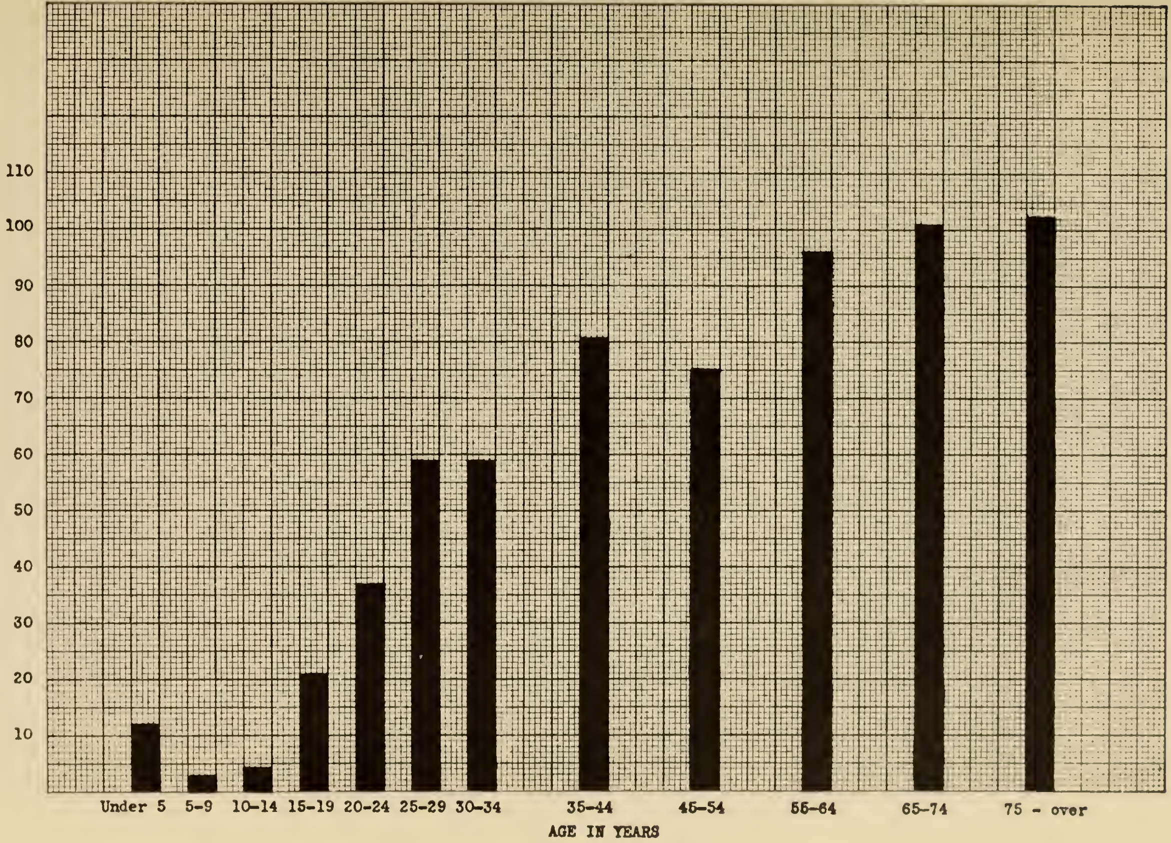
Serological tests (Kahns) were made on all adults (416). Of the 416 tests, 35 (8.4%) were positive.

STUDY ON N. Y. A. ENROLLEES IN COLORADO

County	Number Tuberculin Tested	Number Negative Reactors	Number Positive Reactors	Percent Positive	Number X-rays	Number Chest Exams.	Number cases Reinfection Tuberculosis Found
Fremont	41	33	8	19.5	11	2	0
Kiowa	7	0	7	100.0	7	0	0
Mesa	67	49	18	27	18	5	2 Minimal
Mesa (rural)	3	2	1	33	3	0	0
Prowers	15	12	3	20	3	0	0
Larimer	25	22	3	12	3	0	1 Arrested
Garfield	6	5	1	16.7	1	1	0
Arapahoe	12	9	3	25	3	1	0
Crowley	25	21	4	16	4	1	0
Montrose	13	13	0	0	0	0	0
Las Animas	108	64	44	40.7	39	7	4 2 ea. Minimal Susp.
Rio Blanco	2	2	0	0	0	0	0
Adams	51	39	12	21	12	6	0
Jefferson	0	0	0	0	1	0	0
Cheyenne	5	5	0	0	0	0	0
Otero	1	0	1	100	1	0	0
Pueblo	157	82	75	47.6	75	3	2 Far Adv.
Douglas	6	6	0	0	0	0	0
Logan	8	8	0	0	0	0	0
Sedgwick	3	2	1	33	1	0	0
Yuma	7	5	2	28.6	3	0	0
Washington	33	28	5	15.2	5	0	0
El Paso	62	43	19	30.6	19	4	0
Weld	145	68	67	46	67	--	--
22 Counties							
TOTALS	657	450	207	31.6	209	30	9


RESIDENCE ALLOCATED DEATHS, BY AGE, FROM TUBERCULOSIS (ALL FORMS) COLORADO AVERAGE 1938 AND 1939

RESIDENCE ALLOCATED DEATH RATES, PER 100,000 ESTIMATED POPULATION, BY AGE, FROM TUBERCULOSIS (ALL FORMS)
COLORADO, AVERAGE 1938 AND 1939



DIVISION OF VITAL STATISTICS

Frank S. Morrison, LL.B., *Director*

INTRODUCTION

The work of this division has been steadily increasing during the past three years, due to the greater demands for vital statistics records by Federal, state and private agencies; increasing use of our records to secure data for special tabulations, surveys, immunization campaigns, and other similar activities; the recently inaugurated program for furnishing immediate proofs of death to the Federal Social Security Board; the securing of data covered by additional questions on birth certificates for the Children's Bureau, which will also be tabulated and utilized locally in our maternal and child health programs; the additional work entailed in collecting reports upon birth certificates of the prenatal serological blood tests and tabulation of this data; the inauguration of the new forms of births, death and stillbirth certificates, and consequent necessity for adoption of new forms of punch cards, with provision for indexing upon punch cards; the continuance of our campaign for better reporting, completion of the WPA project for collection of marriage and divorce statistics; coordination of statistical procedures with those of the Division of Epidemiology; and such field work as the director has been able to do consistent with time and funds available.

The Division, in view of the increased activities of the department, which have nearly tripled during the past three years, has been seriously handicapped by lack of personnel, which has been intensified by extended absence due to illness of individual employees. The personnel of the Division consists of the director, a statistician, two full-time clerks and one half-time clerk, whereas in other bureaus of vital statistics in states having approximately the same population, and carrying on equivalent activities, as many as ten clerks in addition to the director are employed.

NOTIFICATIONS OF BIRTH REGISTRATION

The plans for issuance of notifications of birth registration for all births currently reported had to be abandoned during the past year, due to lack of personnel. The city of Denver is now issuing these notifications for births which occur in Denver, which comprises approximately one-third of the state's population. This office has therefore undertaken the issuance of notifications of birth registration for the remainder of the state, in order to secure the advantages to be derived from the improvement in reporting from this work. These notifications of birth registration are printed upon special forms on the mechanical punch card tabulator, from the birth index punch cards, and mailed in franked window envelopes.

CENSUS BUREAU BIRTH REGISTRATION SURVEY

This Division is cooperating with the Census Bureau in the survey of completeness of birth reporting, being carried on in connection with the 1940 census. It is understood that when the special transcripts of birth and infant death certificates now being furnished to the Census Bureau have been checked against the corresponding records secured in the census, the Division will be furnished information as to incompleteness or discrepancies in birth registration for the purpose of correcting the deficiencies through direct field work in the state. This will not only involve considerable additional office work, but also much field work for which personnel and traveling funds are not presently available. In view of the unusual opportunity presented to secure accurate information on the status of birth registration in the state, not only should the fullest advantage be taken of it, but also the results should be utilized to carry on work in those areas where birth reporting is shown to be incomplete.

SOCIAL SECURITY PROOFS OF DEATH

The work of furnishing immediate proofs of death of social security clients, to the Federal Social Security Board recently inaugurated, is being continued, and it is understood that the demands for such cooperation with the Social Security Board will probably be materially extended during the coming year. This Division is, of course, desirous of giving such cooperation to the extent of the personnel available.

1940 CENSUS

It is highly desirable, in connection with the 1940 census, to take the fullest advantage of the population data made available, by correcting birth, death, marriage and divorce rates for intercensal years, and tabulating same; the tabulation of occupational statistics, and special statistics for Indian, Mexican and Negro population groups; and such other special statistics and studies as may seem desirable in connection with the expanding public health program and other related activities. It is also planned, in view of the adoption of the new International List of Causes of Death, to code and tabulate 1940 mortality statistics, both recorded and residence allocated, according to the new list.

MATERNAL AND CHILD HEALTH

The special data being collected for the Children's Bureau is now made use of locally in our maternal and child health and other related work. New punch cards have been adopted for tabulation of this data and it is hoped that the Division can carry on the supervision, detail office work, querying, and tabulation work necessary to insure that such statistics will be complete and accurate, and are made available for use to the best possible advantage.

MARRIAGE AND DIVORCE RECORD PROJECT

The field work on the marriage and divorce record project, involving the collection of over 550,000 marriage and divorce records, has practically been completed, except for the years 1939 and 1940, and our central index is available for use. The work of tabulating the data annually for each county likewise has been practically completed. The principal work remaining is the typing and cross-indexing of the records, statewide tabulation of the reports by county, with master recapitulation, and bringing the records up to date for 1939 and 1940. This work, it is expected, will be completed the latter part of this year.

Provision must be made for the Division of Vital Statistics to continue this work, and it is hoped that legislation can be secured placing the registration of marriages and divorces in the Division of Vital Statistics upon a fee basis, which will make the work self-supporting. The only other alternative appears to be the collection of these records through the local registrars, and absorption of the office work by the personnel of the Division.

TABULATION AND INDEXING FACILITIES

As of January 1, 1940, an index punch card was adopted for birth, death, and stillbirth certificates in addition to the regular statistical punch card, the index card containing sufficient information to enable us to use it (1) for our current index of births, deaths, and stillbirths; (2) to make printed birth registers for our county health units, which can be extended to every county in the State if the demand arises; (3) for making all of our routine monthly reports on births, deaths and stillbirths; (4) for issuing Notifications of Birth Registrations; and (5) for selecting certain cards as occasion requires for reference to individual certificates. The value of this latter feature was demonstrated in the recent Cancer Survey, for which the cancer mortality cards were segregated by our sorting machine, enabling the workers to refer directly to the certificates from the name and certificate number on the punch cards, thus eliminating the necessity for checking through all of the death certificates. (6) It enables us to keep our current index up to within thirty days after the receipt of the certificates, whereas in 1937 our index was over two years behind.

With the aid of our alphabetic tabulating machine, it will be possible to print from the punch cards a ledger index easily, quickly, and economically. This will eliminate the necessity of an expensive W. P. A. project costing thousands of dollars to do this work as has been done in the past.

NATIONAL DEFENSE

The national defense program has imposed the burden upon vital statistics offices of furnishing proofs of age and citizenship of employees in national defense and related industries. The sharp increase in the demand for such proofs took the Division completely by surprise, and in a comparatively short time the work was more than thirty days behind, with a backlog of some 2,000 unanswered requests for certified copies, and a much larger backlog of requests for verification of age and citizenship. With the installation of a photostat machine for issuance of certified copies, and the aid of a W. P. A. project, this backlog has now been eliminated. The work is now being kept up currently, although the volume of requests still continues to increase.

CONCLUSION

While the Division has not only been able to keep up its routine activities, increasingly heavy as they have been, but also to add additional functions, it will be appreciated that personnel problems have made it necessary to curtail much of the detail work which should be done currently to insure a high quality of records, and the best service to the public in the handling of inquiries and issuance of certified copies and birth notifications. The fact that the work of the Division has been kept up currently has been due largely to the simplification and the elimination of a large volume of work formerly done by hand, by the use of mechanical tabulation and indexing equipment.

ANNUAL STATISTICAL REPORTS

The annual statistical reports of the Division of Vital Statistics for the years 1937-1940, inclusive, are published in separate supplements which are available upon request.

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